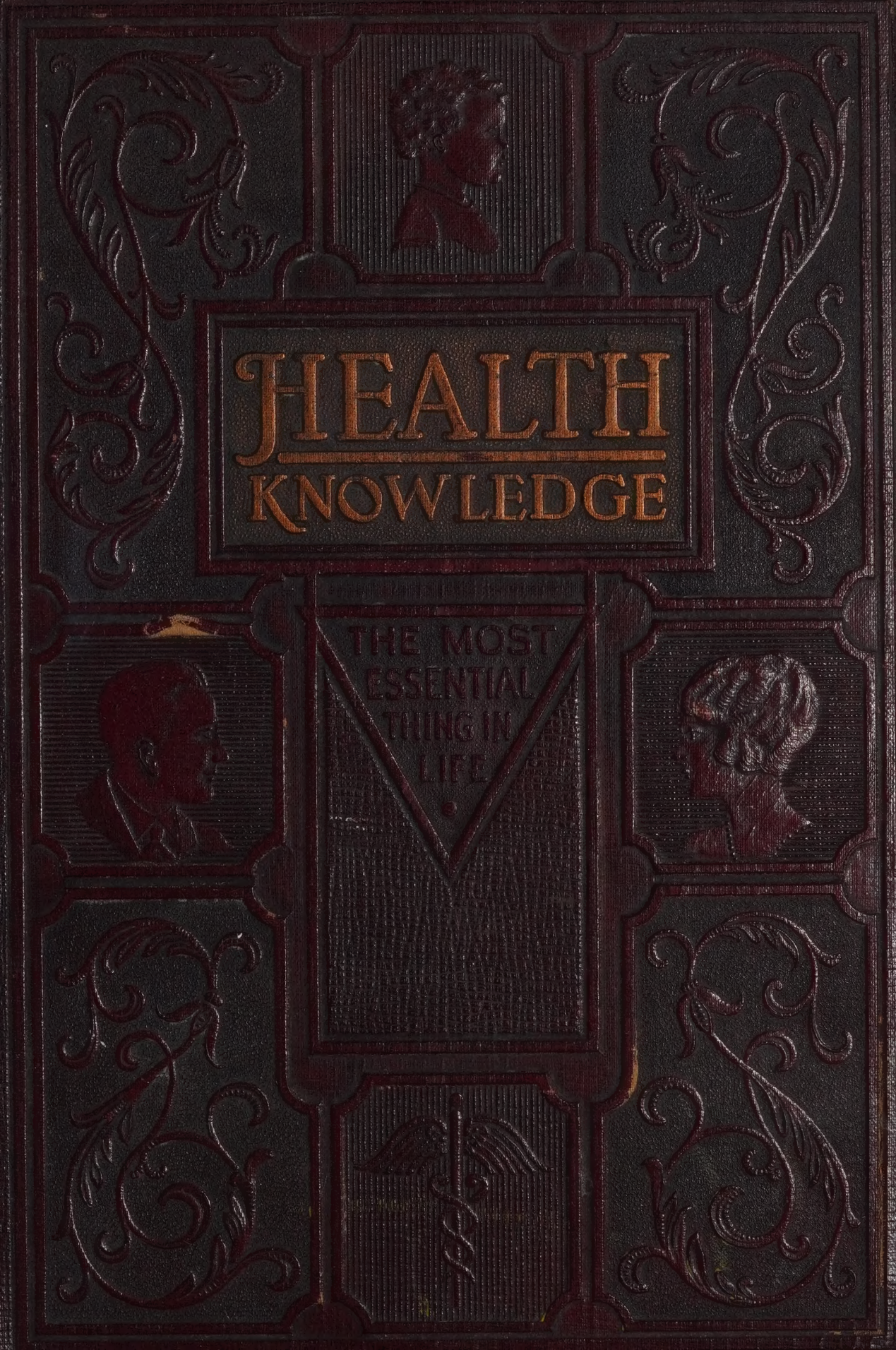
HEALTH
KNOWLEDGE
THE MOST
ESSENTIAL
THING IN
LIFE

HEALTH KNOWLEDGE

A THOROUGH AND CONCISE KNOWLEDGE OF THE PREVENTION, CAUSES, AND TREATMENTS OF DISEASE, SIMPLIFIED FOR HOME USE

THIRTY-FOUR DEPARTMENTS

INCLUDING

PRENATAL CARE AND THE CARE OF INFANTS, HEALTH IN CHILDHOOD, PREGNANCY AND MOTHERHOOD, WOMEN'S PHYSICAL CHANGES AND THEIR DISORDERS, DISEASES OF WOMEN, PHYSICAL CULTURE AND DEEP-BREATHING EXERCISES FOR MEN AND WOMEN, PHYSICAL CULTURE AND MASSAGE FOR INFANTS, FOODS AND THEIR VALUES, HOME NURSING, HOME REMEDIES, MEDICAL PRESCRIPTIONS IN LATIN AND ENGLISH, PLANTS, VEGETABLES, FRUITS, HERBS

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ASSISTED BY A CORPS OF COMPETENT PHYSICIANS AND SURGEONS FROM THE LEADING HOSPITALS, COLLEGES AND UNIVERSITIES OF THE UNITED STATES AND FOREIGN COUNTRIES

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FIRST AID

INTRODUCTION

BY First Aid is meant the assistance which can be given in cases of accidents or emergencies by those who, with certain easily acquired knowledge, are in a position not only to relieve the sufferer to a considerable extent, but also to prevent any further mischief being done pending the arrival of a doctor. Consequently it will be realized that the extent of the first aid depends largely, in the hands of one possessing such knowledge as will be gained by a study of this department, on the distance from proper medical help. In towns where a doctor can be summoned without much loss of time, we need what may truly be called First Aid; in distant and outlying parts much more can be done to alleviate the suffering and promote the physical and mental well-being of the patient, if not, indeed, to hasten the recovery, and many lives have been saved by the prompt action of the man on the spot in cases of accident. There are a few general principles on which anyone can act. Above all, it is necessary to keep cool and collected; much can be done quickly without the appearance of hurry and panic so distressing to everyone, and not the least to the patient.

Should there be an obvious cause of injury or danger, it must be removed as soon as possible, and in the case of more than one injury, discretion must be exercised as to which to tackle first. In all cases where there is bleeding, the first object must be to control this by whatever means is most convenient and suitable. With any accident there is always a certain amount of shock: the best means of keeping this as small as possible is by warmth. See that the patient is well covered up and in the position of greatest comfort compatible with the injuries. It is not usually necessary to remove any clothing, but in cases where it is advisable, this must be done with the minimum of discomfort to the

patient, regardless of the consequences to the clothes. In removing a coat the sound arm should be withdrawn first: this will enable the sleeve to be pulled gently off the other arm without much trouble, or it may be necessary to rip up the sleeve on the affected side. A shirt should be completely slit up the front, and removed in a similar manner to the coat. Trousers can be easily removed by slitting up the outer seam, and shoes by slitting up the back seam and removing the laces. Socks should be cut off, preferably by a pair of blunt-pointed scissors.

Care must be exercised in attempting to stimulate a person who has met with an accident. Spirits should not be rashly given, nor, indeed, should anything, till it is certain that the patient can swallow. A drink of water, milk, tea, or coffee is all that should be given. Smelling-salts may be applied to the nose, and cold water applied to the face and head.

In the excitement of the moment, what is everybody's business is apt to be no one's; and it is too often taken for granted that medical aid has been summoned, though no one has actually been sent. The person who takes charge of a case must see to it that someone has gone for a doctor at the very beginning. Should the doctor arrive immediately, the case is in his hands, and the best thing has been done for the patient; should there be a delay, it is not due, in any way, to the person who sent for help at once, and in the meantime much may be done till the doctor arrives.

ASPHYXIA

Definition.—Asphyxia means literally absence of pulse, but is the name given to the whole series of symptoms which follow stoppage of breathing and of the heart's action from any cause.

Causes.—For practical consideration by far the most important cause is *drowning*. Blockage of the air-passages occurs in some diseases, such as croup, diphtheria, swelling of the throat due to wounds or inflammation, asthma (to a partial extent), tumors in the chest (causing slow asphyxia), and the external conditions of suffocation and strangling. Poisonous gases also cause asphyxia. Carbonic acid in large amount in the air, due to the breathing of a number of individuals in a small space, as in the Black Hole of Calcutta, or to the fumes of a charcoal brazier in a badly ventilated room, has often caused death. Coal-

gas is still more deadly, and several gases, such as sulphurous acid (from burning sulphur), ammonia, and chlorine (from bleaching-powder), cause involuntary closure of the entrance to the larynx, and thus prevent breathing. Other gases, such as nitrous oxide (or laughing-gas), chloroform, and ether, in poisonous quantity, cause stoppage of breathing by paralyzing the respiration-center in the brain.

Symptoms.—In the vast majority of cases death from asphyxia is due to insufficiency of oxygen supplied to the blood. The first signs—apart from instinctive efforts to escape from the cause, such as the struggles of a drowning man—are rapid pulse and gasping for breath. Next comes great increase in the pressure of the blood, causing throbbing in the head, with lividity or blueness of the skin, due to failure of aeration of the blood, followed by still greater struggles for breath and by general convulsions. In this stage, the veins and right side of the heart become overfilled with blood, owing to stoppage of the circulation, which follows contraction of the minute arteries all over the body from the irritation of the impure blood in them. Accordingly, the heart becomes over-distended and gradually weaker, a paralytic stage sets in, and all struggling and breathing slowly cease. When, on the other hand, asphyxia is due to charcoal fumes, coal-gas, and other narcotic influences, there is no convulsive stage, and death ensues gently and may occur in the course of sleep. These are the chief signs of death by asphyxia, but each cause produces distinguishing signs of its own.

Treatment.—So long as the heart continues to beat, recovery may be looked for under prompt treatment. The one essential of treatment is to get the impure blood aerated by artificial respiration. When the heart is very feeble or even stopped, the face extremely blue, and the veins of the neck and arms swollen, the person's life may possibly be saved by opening a vein in the arm or neck, and so allowing the blood to escape and the heart to contract again.

BANDAGING

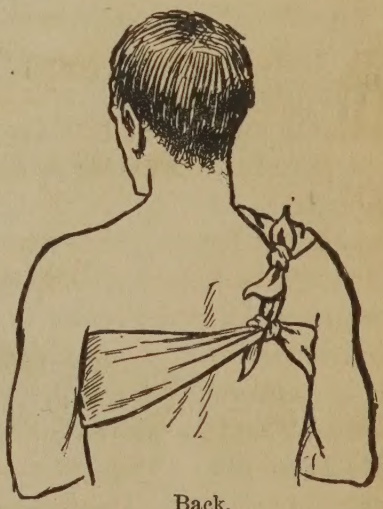
Bandages are pieces of cloth made of different materials used as a support for injured parts or to cover wounded surfaces. There are two common forms of bandages, the emergency triangular bandage and the ordinary roller bandage.

The triangular bandage is valuable for any accident or ambulance work. It is now used on the battle-field when medical attention is not at hand. It is made by taking a piece of calico or other soft material, about one yard square. This is then cut across cornerwise, making two triangular bandages; these may be folded over to form a narrow band, or applied without folding.

Bandage for shoulder. Two triangles: one folded into sling for wrist; the second with point on neck and ends tied around the arm.

Bandage for elbow. Triangle folded broad is laid with center on elbow; ends are crossed in front, carried round forearm, crossed again in front, carried round upper arm and tied.

Front.

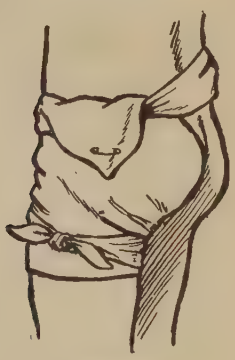


Back.

Bandage to cover chest. One triangle: the point is laid over one shoulder, the ends carried round the sides and tied over the same shoulder-blade; the longer of the two ends is carried up and tied to the point. To cover the back the same bandage is used with knots in front.

Bandage for groin. Two triangles, folded narrow and tied end to end.

First stage.



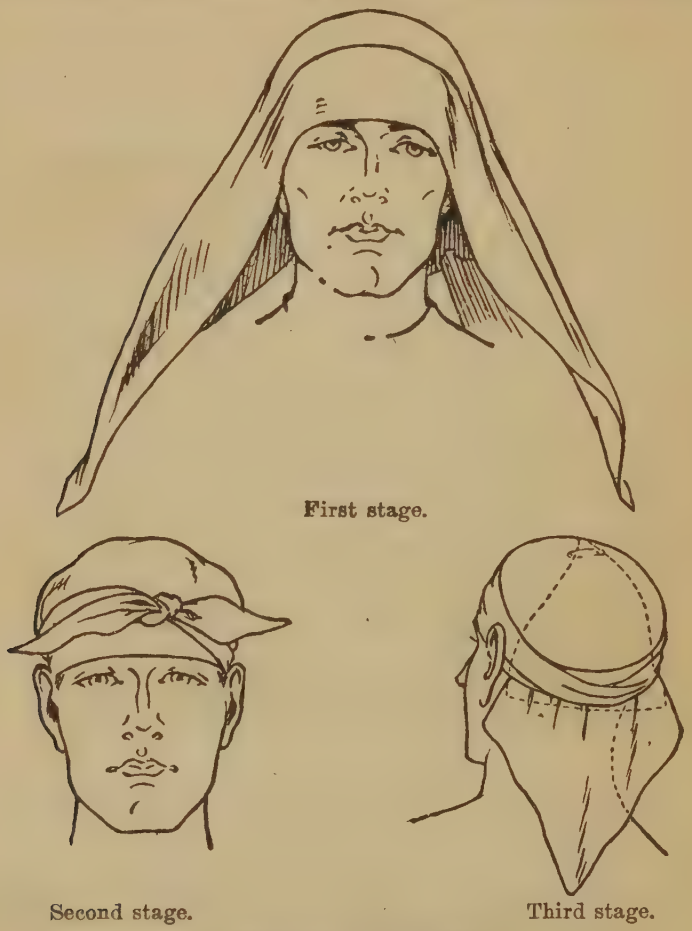
Finished.

Bandage for hip. Two triangles: one folded narrow and tied round waist; the other with point on the side and ends tied round thigh.

Bandage for head. (See next page.) Triangle with a hem turned up on base is placed with center of base on forehead and point on back of neck; ends are carried behind head, crossed on neck, carried forward, and tied on forehead. Point is finally pinned up, and is complete.

Roller bandages are strips 10, 15, or 20 feet long, and varying in width from 2 to 4 inches, according as a limb or the body is to be covered. They are generally sterilized before use, or impregnated with some antiseptic, and may be of flannel, which can be washed and used repeatedly, of calico, or of cheesecloth. The chief methods of applying roller bandages are: *Simple spiral,* in which the bandage circles up the limb, each turn overlapping half of that preceding. This is used for a cylindrical

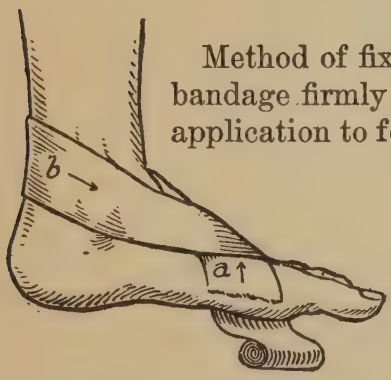
part of the body like the upper arm. *Spiral with reverses,* in which the bandage is turned sharply over on itself at each circle so as to lie smooth when the circles tend to separate widely. It is used for conical parts like the forearm or calf. *Figure of 8,* in which the bandage loops alternately round two parts of the body. It is used to cover a projection or hollow such as the



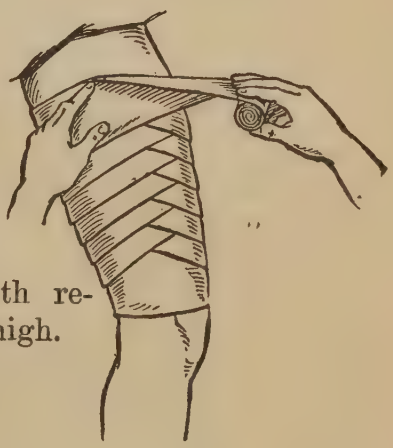
BANDAGE FOR HEAD.

shoulder or armpit, by looping round trunk and arm alternately. *Spica,* which is used for a joint, the turns covering one another completely in the bend of the joint, and separating partly over the prominence like the arrangement in a coat of mail. It is simply a modified figure of 8. *Trefoil* is a turn round the limb, and covering this with the subsequent turns of the bandage. The bandage must pass upward or the limb will become blue owing to the blood in the superficial veins being pressed backward to-

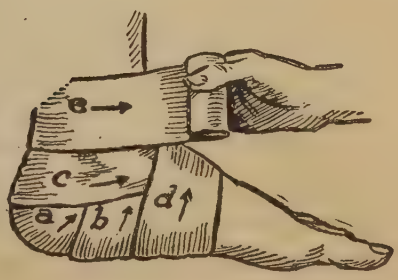
ward the extremity of the limb. It should cross the front of the limb from within outward in order to give more room for making reverses toward the outer side. Where skin surfaces come into contact, one should be separated from the other by absorbent cotton, as otherwise moisture accumulates and the surfaces readily become abraded. This should be done, for example, between the fingers, behind the ear, in the armpit, etc. In order to make the bandage lie smoothly it is important in applying it that the head of the bandage should always, except in reversing, remain in contact with the part that is being bandaged, round which it is simply rolled. The width of roller bandages varies; for the finger, 1 inch is the usual width; for the head, 2 inches; for the arm, 2½ inches; for the leg, 3 inches; for the abdomen or chest, 4 or 5 inches.



Method of fixing bandage firmly for application to foot.



Spiral with reverses for thigh.



Bandage covering heel. First turn covers heel, second and third bind down its loose edges; fourth and fifth bind down the loose edges of second and third.

Bandage for the eye. Triangle folded narrow; center is placed over the eye, ends carried around the head, crossed, carried forward and tied.

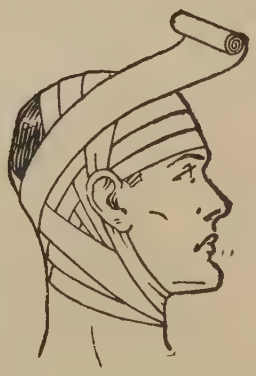
Bandage for lower jaw. Two triangles folded narrow; place one with center under chin and the other with center in front of chin. The former is tied on top of forehead, the latter is tied in back of head. The ends of both are tied together and completed.

Bandage for side of head. Triangle folded narrow; center is placed over one ear; one end carried over the top of head, the other beneath chin; the two turn over each other above the opposite ear and are then carried to the forehead and tied.

First stage.

Second stage.

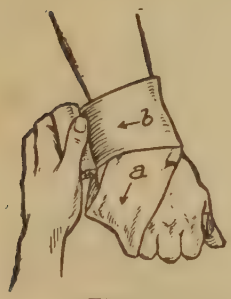
Third stage.



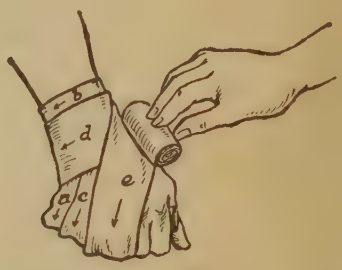
Fourth stage.

Bandage for head (trefoil). This consists essentially of three turns repeated in order. The first stage shows commencement on the nape of the neck and first turn; the second stage shows second and third turns, the bandage next passing below chin and round to nape of neck; the third stage shows the gradual covering in of head; the fourth stage shows the final action. To fix all a final turn in the position of the first should be made low down on the nape of the neck behind and close above the eyebrows in front.

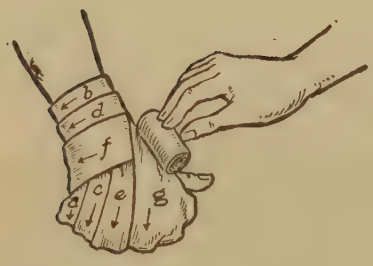
Same bandage (trefoil) from the other side. Shows that the vertical turns pass behind the ear on one side, in front of it on the other. When bandage is used to cover in one ear, the first turn should pass round the other side of the head, as shown. This bandage cannot be used to cover in that part of the head shown bare in the fourth stage, for which the capelline bandage or a four-tailed bandage may be used.



First stage.



Second stage.

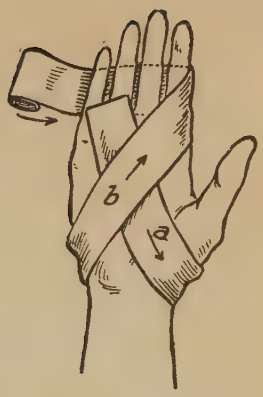


Third stage.

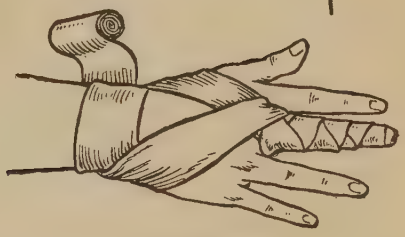
Fourth stage.

Bandage for closed fist, in which a pad of wool should be placed. There are alternate loops round wrist and round knuckles.

Method of fixing bandage before commencing spiral with reverses for hand.

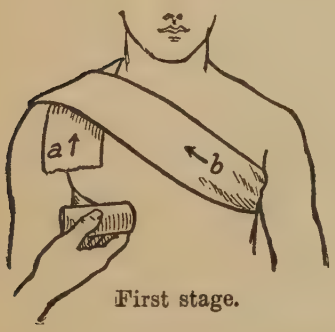


First stage.

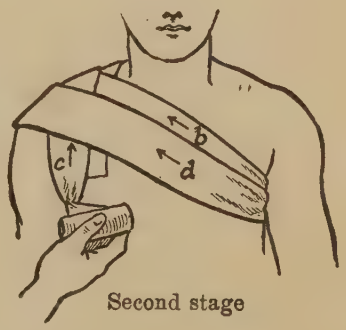


Second stage.

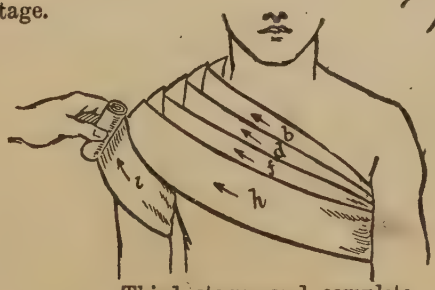
Bandage for finger. The first stage starts round wrist for the purpose of fixing, and passes in an open spiral down to the point of the finger; the second stage passes upward again as a spiral with reverse at each turn, and ends round wrist.



First stage.

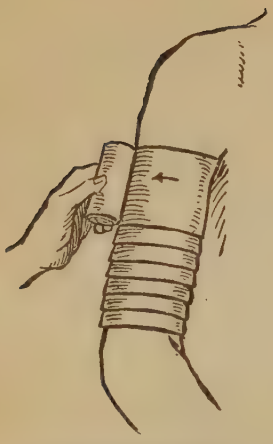


Second stage



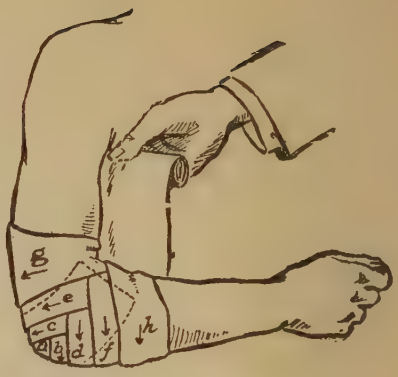
Third stage, and complete.

Spica for shoulder or armpit.

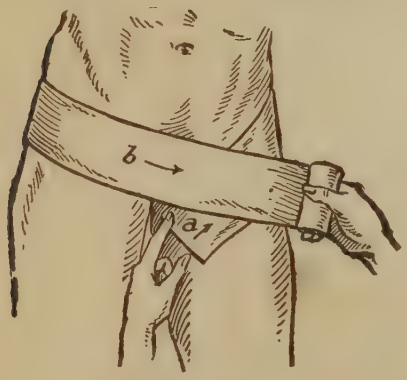


Simple spiral for arm.

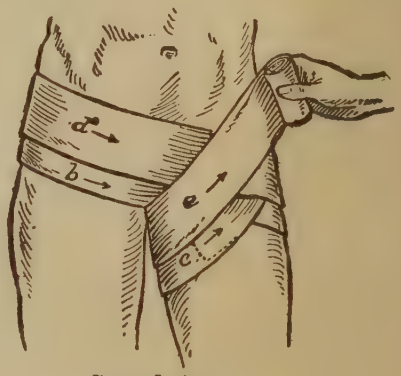
Spiral with reverses for hand and forearm.



Spica for elbow.



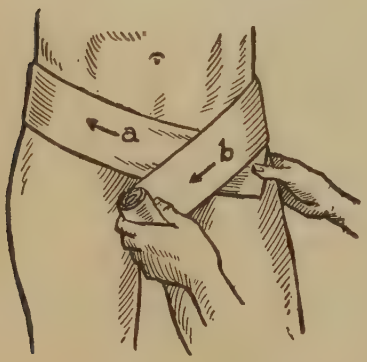
First stage.

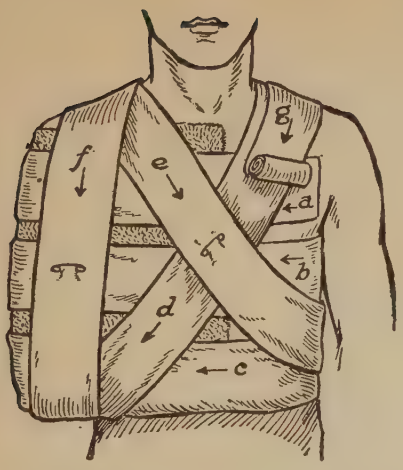


Second stage.

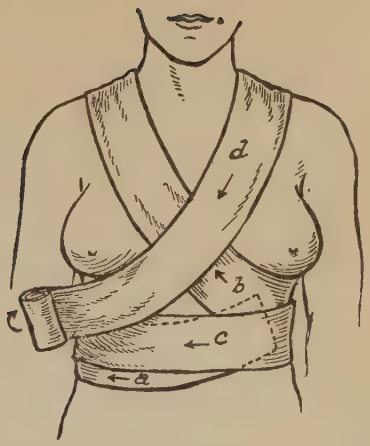
Ascending spica for groin.

Commencement of descending spica for groin. In the ascending spica the bandage runs up across the front of the thigh and each turn is higher than the one before. In the descending spica the turns across the thigh run down and each turn is at a lower level than its predecessor. The body turns pass round the pelvis, not round the waist. When both groins are to be bandaged, a turn of ascending spica on one alternates with a turn of descending spica on the other; after each pair of turns a complete circular turn is made round the pelvis.





Bandage to fix a dressing on the chest and cover in the arm. In actual practice a wider bandage would be used, and the turns would overlap. For clearness they are here shown separated.



Bandage to support the breasts. A wide bandage is used. After each pair of turns beneath the breasts a circle to fix is taken around the waist.

First stage.

Bandage completed, front view.

Bandage completed, back view.

Capelline bandage for head. Two bandages are stitched end to end. The bandage is rolled off one to the other till one roller is half as large again as the other. The larger part circles round the head close above the eyebrows and ears, and low down on the back of the head, binding down at each turn a strip of the other, which passes alternately backward and forward on either side.

BITES, STINGS, AND POISONED WOUNDS

Bites of animals are in general to be treated as punctured or lacerated wounds, but seeing that animals' teeth are in general foul, suppuration is very apt to arise if the bite be deep. The bite of some reptiles, scorpions, spiders, etc., causes definite symptoms of poisoning, while, after the bites of several animals, especially the wolf and the dog, there is often a risk of hydrophobia.

Dog bites may be treated with any simple dressing, such as carbolic lotion (1 to 40), applied on lint covered with gutta-percha tissue, and the dressing renewed twice daily for a few days, till the wound is clean. If, however, there be any fear of hydrophobia, a physician should immediately be consulted.

Snake bites are not necessarily poisonous, for not only are many snakes harmless, but persons can, like the snake-charmers of India, render themselves immune by the injection under their skin of gradually increasing doses of the poison. The principal poisonous snakes belong to the viper and cobra families, and all inject their poison through a pair of grooved or hollow teeth connected with poison-glands. The symptoms of snake-poisoning are swelling and paralysis of the bitten part, with general depression, palpitation, difficulty of breathing, faintness, and later paralysis and convulsions, followed, in bad cases, by death. The treatment recommended by Calmette is to put a tight band at once between the bite and the body, so as to stop the circulation (the band may be left on for half an hour); to make a cut half an inch deep and one inch long following the bite; to press, wash, and suck the wound; and later to inject, into the tissues around, permanganate of potassium solution (1 to 100 of water) or chloride of lime (two per cent.), which destroys the poison. Whisky, aromatic spirits of ammonia, strong tea, or coffee should be given by the mouth to stimulate the feeble heart. The person

should rest quietly, and, if breathing becomes difficult, artificial respiration should be performed.

Toads and salamanders secrete a milky fluid from the skin of the back which is irritating locally, and which, in small animals and weakly children, is said to kill if introduced by a wound.

Centipedes, scorpions, and tarantulas (large tropical spiders) kill their prey by poison, and can inflict a very painful, though probably seldom fatal, bite on human beings. The treatment is to suck the wound and apply one of the following: vinegar, ammonia, ipecacuanha, spirit of camphor, camphor and chloral rubbed together, tobacco juice, turpentine, or some opiate. If an abscess forms it is to be treated like an abscess from any other cause.

Harvest-bugs, fleas, lice, and mosquitoes often cause great irritation of the skin by their bite. Harvest-bugs may bury themselves in the skin and have to be picked out with a needle. Lice may be got rid of, if on the body, by rubbing with sulphur ointment or white precipitate ointment; undergarments should be boiled, to kill the nits, and those which cannot be boiled should be baked in the oven. If the lice are in the hair, saturate it with petroleum or carbolic lotion (1 to 60) and wear an oilskin cap overnight for three successive nights. They may be got rid of by burning sulphur for several hours. Mosquito bites are soothed by bathing with salt water or painting with aromatic spirits of ammonia, oil, or laudanum, and they may be prevented, to some extent, by smearing the skin with citronella-oil, camphor-water, lime juice, or one of the oils of pennyroyal, lavender, cloves, or cinnamon.

Ants, bees, wasps, and hornets cause great irritation by the stings with which the females and workers are provided. Those of ants are allayed by eau de Cologne or ammonia. Bees, wasps, and hornets sometimes leave a part of their sting, as well as poison, in the skin, and this should be looked for first of all and pressed out. It is popularly supposed that a nest of hornets can sting a man or animal to death. The sting of a wasp in the throat, the insect having been taken into the mouth in biting a fruit, has caused death owing to rapid swelling, which blocks the air-passage. Many things give relief from the pain, such as ammonia, soap, chloral and camphor, tobacco juice, or onion juice locally applied.

Jellyfish and hairy caterpillars, the former by threads which they discharge, and the latter by brittle, poisoned hairs, cause an itchy red rash after contact. It is relieved by vinegar or olive-oil.

Nettle stings are relieved by bruised dock leaves or raw onion juice.

Arrow poison is sometimes dreaded when children have been playing with arrows from the East Indies. Unless, however, the arrow has been actually driven into the flesh, the amount of poison absorbed would probably be insufficient to do any harm. The poison on these arrows is sometimes one causing convulsions, in which the general treatment is that for strychnine poisoning, or more generally it is of the nature of curara, causing paralysis, in which case, if the breathing should begin to fail, the proper treatment would be artificial respiration.

BRUISES—CONTUSIONS

Bruises are more or less extensive injuries of the deeper parts of the skin and underlying tissues, accompanied generally by outpouring of blood from damaged vessels, but unattended by corresponding open wounds.

Varieties.—An extensive bruise may be accompanied by a wound, in which case the injury is known as a contused wound.

The simplest type of bruise is one in which the deeper layers of the skin only are damaged, causing a slight bluish discoloration due to the tearing of minute vessels and the escape of blood into the cellular spaces of the skin. As the result of a severe blow, the muscles may be bruised and torn without any wound in the skin, and the resulting effusion of blood may cause a large swelling which sometimes, though not usually, results in the formation of an abscess. When a bone is bruised, as by a kick on the shin or by a fall upon the knee or elbow, changes similar to those which follow an actual fracture are produced, and a permanent thickening of the bone very frequently results. Bruises of this type are of great importance, because an effusion of blood into the cavity of a joint leads to stiffness lasting some weeks, which may, if absorption of the blood be not complete, remain in some degree permanent owing to the formation of adhesions. Further, it is held by many authorities that some slight injury of this nature is in many cases the starting-point of the tubercular dis-

ease which frequently attacks the bones of children. Severe bruises of internal organs, as from a crush or run-over accident, sometimes occur even when the skin has escaped injury and shows no mark. Bruising of the brain or spinal cord sometimes occurs in consequence of a severe shaking, as in a railway accident, and is known as concussion.

Appearance of a Bruise.—The extent of a bruise and the depth of its tint depend upon the amount of blood which has escaped from the vessels, and this again varies according to the violence of the blow and peculiarities of the person injured. In some diseases, like scurvy, extensive bruises are produced by little or no violence. Sometimes a bruise is so sharply limited that it gives a distinct impression of the instrument with which it has been inflicted, while in other cases the blood runs downward and produces a black mark at some distance from the injured part, as seen, for example, in the blackness beneath the eye which may follow an injury of the forehead or temple.

The color of a bruise is at first black or bluish, later becoming brown, and finally changing to yellow, which fades away as alterations take place in and absorption occurs of the blood pigment. The time occupied in disappearance of a bruise depends largely upon the amount of blood effused, but in moderate bruises ten days or a fortnight must elapse before the injury ceases to be noticeable.

Treatment of slight bruises consists chiefly in preventing the effusion of blood after an injury, by means of cold compresses firmly fixed in position by suitable bandages. Ice may also be applied with good results. If it be not convenient to apply cold, various astringent substances may be used in the form of evaporating lotions kept in contact with the part for eight or ten hours; or the skin may be painted with hazeline or tincture of arnica. In painful bruises one of the best applications is lead and opium lotion. The injured part, if a limb, should be elevated in a sling or on a couch. After the first day or two, when no more effusion will take place, gentle massage away from the bruise toward the body helps absorption and loss of the discoloration.

Mere surface bruises and abrasions are benefited by application of hazeline, or if the skin be much ruffled or ingrained with dirt it is well to apply for a few days a piece of boracic lint in the form of a water-dressing.

BURNS AND SCALDS

Burns are injuries caused by dry heat, scalds by moist heat, but the two are similar in symptoms and treatment. Severe burns are also caused by contact with electric wires, and by the action of acids and other chemicals.

Degrees of Burns.—The French surgeon Dupuytren divided burns into six degrees, according to their depth.

1st Degree. There is simply redness. Such burns may be painful for a day or two.

2d Degree. There is great redness, and the surface is raised up in blisters. There is much pain, but healing occurs without a scar.

3d Degree. The scarf-skin, or epidermis, is all peeled off, and the true skin below is in part destroyed, so as to expose the endings of the nerves of sensation. This is an excessively painful form of burn, and a scar follows on healing.

4th Degree. The entire skin is destroyed, with its nerves, so that there is much less pain than in the last form. Not only does a scar result, but it contracts later and may produce great deformity.

5th Degree. The muscles also are burned, and still greater deformity follows.

6th Degree. A whole limb is charred. It separates as in gangrene.

Symptoms.—For the first two days the chief symptoms are pain, varying with the degree of the burn, and in severe cases the condition of lowered vitality called shock. It is said that even superficial burns of as much as one third of the skin-surface are always fatal. After forty-eight hours, in cases of the third and higher degrees, inflammation of the part and fever are very apt to come on, and in extensive burns over the head, chest, or abdomen, there is great risk of inflammation in the membranes covering the internal organs beneath the burn. Later, when the burnt parts slough away, there is much suppuration until the gap finally heals. All through this stage there is, in extensive burns, a liability to death from ulceration of the bowels. Healing is slow, and if the burn is deep, as above stated, there is often terrible deformity.

Treatment.—Very trifling burns are soothed by applying soap or by running tepid water over the burnt part. For severer burns there are three sorts of application: (1) *Dry dressing.* This consists of a dusting-powder of flour, starch, or starch and boracic acid in equal parts, which is powdered thickly on the burn, the part being then wrapped in absorbent cotton. Or muslin is wrung out of a saturated solution of picric acid in water and laid on the burn, which it hardens and dries. Or the burn is washed thoroughly (under an anesthetic) with perchloride-of-mercury solution and dressed with antiseptic wool. (2) *Wet dressing,* either of soda lotion consisting of two teaspoonfuls of baking-soda to a tumblerful of tepid water, out of which clean lint is wrung and applied covered with oil-silk, or boracic acid lotion (1 to 30) similarly applied. (3) *Oily dressings,* of carron-oil containing lime-water and linseed-oil in equal parts, or lime-water and a mixture of eucalyptus-oil with olive-oil, or of boracic ointment spread on lint.

Before the dressing is applied the charred remains of the clothes must be removed gently and in small pieces, after soaking in tepid water or oil, because the burnt skin often sticks to them. If the burn be large, and a doctor is to see it, no oily application should be made beforehand, because oil is very difficult to remove if it is desired to change the type of dressing, but there is no harm in applying soda or boracic lotion at once. For small burns carron-oil is very soothing. When suppuration is going on, boracic lotion is perhaps best, and when healing is advancing boracic ointment on lint may be used.

Children sometimes scald the mouth and gullet by drinking from the spout of a kettle; and for this, teaspoonful doses of a mixture of cod-liver oil and lime-water, from time to time, give relief.

The shock accompanying a bad burn must be treated by stimulants, and later by stimulating diet.

CLOTHING AFIRE

Everyone should know how to deal with a person whose clothes have caught fire. Throw the person on the ground at once, on his face if it is the clothes of his back which are burning, on his back if the fire has attacked his clothes in front. This is done

because the flames always rise, and are so turned away from the body. The flames must be subdued by excluding the air. Cover the patient with a rug, table-cloth, overcoat, blanket, or any such heavy substance, and roll him about in it. Get the windows and doors closed so as to prevent free access of air to the flames as far as possible. In addition to this, water may be freely thrown over the person, not only to extinguish the flames but to cool the smoldering clothes. The clothes should be removed as soon as the flames have been overcome, and the patient placed in a warm bath.

DROWNING

In drowning, death as a rule ensues from asphyxia, though, in falls from a height upon water, or in cases where the body in falling has encountered blows upon the head or abdomen, death may be due to shock. In the latter case, instead of the signs of asphyxia, the skin is pale, face placid, and the lungs are empty of water, because no attempts at breathing have taken place. In slight cases of shock the chances of resuscitation are rather more hopeful than in cases of asphyxia, because little water has been drawn into the lungs, and because there has been no struggling. It must be remembered that complete deprivation of oxygen results in death after three to five minutes, and therefore recovery is unlikely if the submersion under water has lasted longer than a few minutes. Therefore speed and immediate treatment on withdrawal from the water are of paramount importance.

The specific gravity of the body being slightly greater than that of water, it sinks at first, then if the person is able to struggle his efforts bring him to the surface, where he remains so long as he can swim, only to sink again as he becomes exhausted. This may be repeated several times, though the popular idea fixes the permanent disappearance at the third time. In these struggles, water mixed with air is drawn into the air-passages, and the two are churned up with mucus into a froth which forms a great obstacle to the entrance of air into the lungs during subsequent attempts at resuscitation. The first step in this process should be commenced *on the instant the body is drawn from the water,* without delay for any examination, removal of clothing, or the like, and consists in the attempt to restore breathing by *artificial respiration.* The same methods of artificial respira-

tion are applicable to other cases of asphyxia produced by inhalation of poisonous gases, or by mechanical obstruction, such as hanging, strangling, or choking. Four methods are available for this purpose:

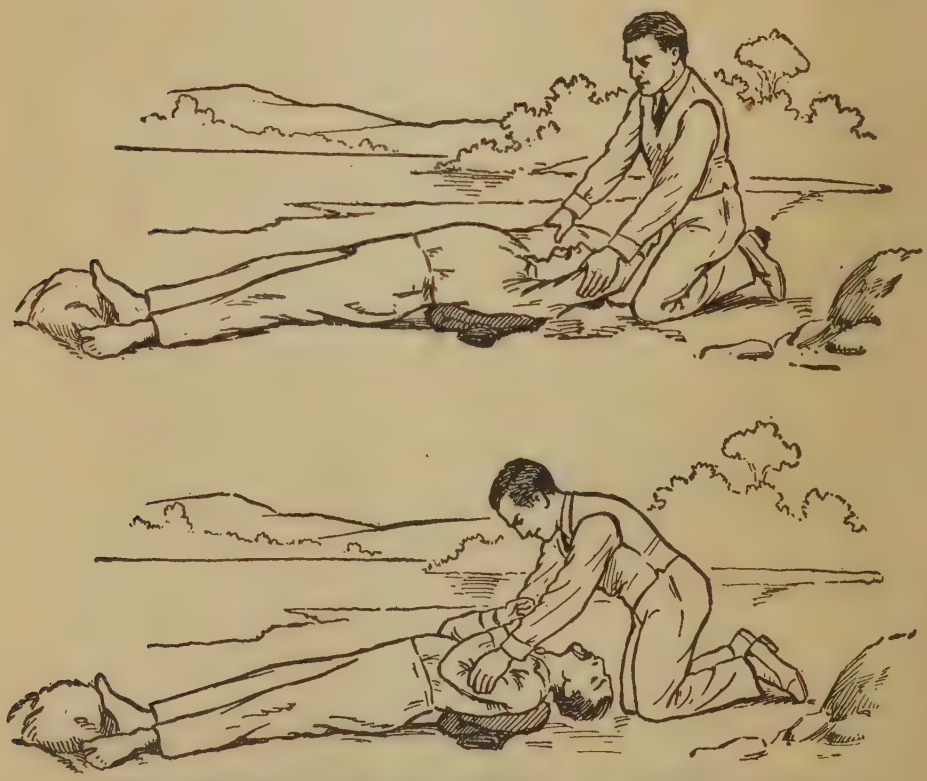
Marshall Hall's Ready Method is valuable for two reasons: first, because it frees one lung thoroughly from its frothy water; and second, because it is a very easy and simple method. A roll about six to eight inches thick is made, for example, out of a rolled-up coat and vest, or a large stone or spar of wood may be used for the purpose. Upon this the chest of the patient is placed face downward, and firm pressure made with both hands upon the back to expel air and water. Then the body, grasped by the shoulders, is turned steadily upon one side, still lying upon the bundle or stone, so that one lung is expanded. Then the body is turned again upon the face so that the air is expelled from the chest, and so forth, each movement being repeated about fifteen times per minute. It is important always to turn the body upon the same side, otherwise water is apt to run from the lung which was previously the lower one, and again choke up the air-passages of the one which has been cleared.

Howard's Method is a much more effective method, but requires considerable skill, and is therefore not suitable for an untrained person. It is the method in which lifeboat-men, firemen, etc., are trained in this country. It is performed in two stages.

(*a*) To free the air-passages of water. Place the body face downward, with forehead on forearm so as to keep the mouth off the ground, and with a *large* tight roll of clothing beneath the pit of the stomach. Let the operator lean for a few seconds heavily upon the back of the patient with his left hand placed over the lower ribs on the patient's left side, and his right hand over the spine lower down, and let him end this pressure with a push. Repeat this two or three times according to the probable amount of water and froth to be expelled.

(*b*) To reëstablish breathing. Place the body face upward with the large roll of clothing beneath the chest, so that the shoulders incline slightly downward but do not touch the ground; bend the head and neck as far back as possible, and place the hands above the head, where the wrists may, if necessary, be fastened together. The waist and chest must be free of clothing. Let the operator now kneel astride of the patient at the level of

the latter's hips, and place his hands with the thumb-tips together, the ball of each thumb just beneath the margin of the ribs, and the fingers each in a space between two ribs. Now let him swing forward from his knees, pressing the drowned person's ribs upward and inward with his hands, till his face almost touches that of the patient, remaining so for two or three seconds to press the air out of the lungs. Let him recover himself with a final sharp push, at the same time taking his hands off the chest, and then remain kneeling upright for two or three seconds, so as to let the chest expand. Repeat this ten times per minute.



Artificial respiration by Silvester's Method. Upper figure, inspiration; lower figure, expiration.

Silvester's Method is fairly efficient and quite simple. Its drawbacks are, that in addition to the operator there should be someone to hold the feet of the patient, though this is not absolutely necessary, and that there may be difficulty in keeping the entrance to the larynx open. To effect the latter, the tongue must be drawn forward, and if necessary held forward either by

means of a cloth or forceps. The patient, after his air-passages have been cleared, as in Howard's method, is placed on a flat surface inclined a little from the feet upward, with a roll of clothing under his shoulders. The mouth and nose are carefully wiped. Then to produce inspiration the operator, placing himself at the head of the patient, grasps his arms just above the elbows, and draws them upward by the side of the head for two seconds. Next, to produce expiration, he turns down the arms and presses them against the patient's chest for two seconds. This is repeated fifteen times a minute. A caution is necessary that the downward movements must not be made too forcibly; for serious damage is apt to be done to the internal organs of an unconscious person by violent pressure.

Schäfer's Prone-Posture Method.

Schäfer's Prone-Posture Method has the advantages of extreme simplicity and great effectiveness. Further, no time is lost in freeing the air-passages of water and mucus, which may drain from the mouth during the whole procedure; there is no trouble caused by the tongue falling backward into the throat, as in the face-up methods; the patient is not so liable to bruising as in the Marshall Hall method, nor to injury of the ribs or liver, which may be occasioned by the Howard method. The introducer of the method also claimed that while the amount of air taken into the lungs of an average-size healthy person is about 5850 cubic centimeters per minute, the amount that can be drawn

in by this method is about 6760 cubic centimeters, an amount far in excess of that possible by the Silvester or Marshall Hall method. While in the Silvester method force is employed to produce inspiration as well as expiration, in Schäfer's method, as in Howard's method, the force is used only to compress the chest, and the chest is allowed to expand by its own elasticity, and draw air into the lungs.

Immediately on removal from the water, place the patient face downward on the ground, with a folded coat under the lower part of the chest, and lose no time by removing clothing. Turn the patient's face a little to one side, so that the mouth and nose are not obstructed. Let the operator kneel astride of or to one side of the patient, facing his head, and let him place his hands over the lower part of the patient's back, one on each side (on the lowest ribs). Let him throw the weight of his body forward upon his hands, so as to press the air (and water if there is any) out of the patient's lungs. Then let him immediately raise his body to take the pressure off and allow the patient's chest to expand. Repeat these movements twelve or fifteen times per minute.

After-treatment for Drowning.—As soon as the patient makes efforts at breathing, these measures are stopped. But no such effort may be made for twenty minutes, an hour, or even in some recorded cases for several hours, and still the person may recover, so that artificial respiration should be persevered with so long as there is the slightest sign of life. Efforts must then at once be made to restore the feeble circulation, and, in cases where the body has been long in water or much exposed during artificial respiration, to regain the body warmth. To this end the patient should be wrapped in hot blankets, with hot bottles to the sides and feet, and the arms and legs should be energetically rubbed upward toward the body. So soon as the power of swallowing returns, sips of hot water, and teaspoonfuls of hot brandy and water, or hot coffee, may be administered. When the heart continues feeble, and indeed during the performance of artificial respiration, but not in such a way as to impede the latter, which is of paramount importance, hot sponges may be applied to the front of the chest over the heart, or a galvanic current passed through the chest. Ammonia, nitrite of amyl, or smelling-salts may for the same purpose be now and then held to

the nose. Finally, if the patient shows a tendency to sleep, this should be encouraged.

ELECTRIC SHOCKS

With the great development of the use of electricity both in public and private life, it is much commoner now than formerly to find persons suffering from shock caused by contact with "live" wires. A live wire is one along which an electric current is passing, and though usually insulated by some suitable material or, as in the case of overhead trolley wires, placed in a position so as to be out of reach under ordinary circumstances, accidents may happen when the insulating material is defective or worn away or the uninsulated wire is exposed to the touch through a breakage or injury to its supports. At the point of contact with the body there may be a serious burn; of more immediate danger is the general condition of the patient owing to the passage of the electric current through the body. This must be stopped as soon as possible. Where it is possible to turn off the current, this must be done. In many cases, however, this is either impossible or would entail too great a delay. The patient must then be removed from contact with the live wire. He may be unable to do this of his own accord because he has been rendered unconscious, or because the muscles of his arms are so affected by the current, in a case where the hands are in contact with the conductor, that he is unable to use his arms voluntarily. He must then be removed by force.

Remember that the human body is a conductor of electricity owing to the amount of moisture or fluid in the body, and that consequently the person in contact with the live wire is, as far as the current is concerned, practically a part of the wire. Care must be exercised, then, by the person about to render aid that he, too, is not placed in a like condition of danger. To do this he must prevent the current passing through his body, by insulating himself from the earth and from the patient. The best non-conductor is glass, on which the rescuer should stand. A couple of bottles may be used, or a pane from a window. India-rubber is also a good non-conductor, and some may be available in one form or other. Other substances may be used, such as wood, bricks, silk, cloth, hay or straw, all of which, when dry,

are non-conductors. Moisture in any form is a splendid conductor of the electric current, and any substance which, when dry, is a non-conductor becomes a conductor if moistened or damp. This applies to all the above. The presence of moisture renders them useless for the purpose required: they can only be effective when dry.

The person in this way insulated from the ground may now pull the patient away from contact with the live wire. The hands should be insulated before applying them to the patient or to the wire. Rubber gloves, being the ideal insulator, are not likely to be available—recourse must be had to other means which are. Any piece of cloth or article of clothing which is dry may be used; a rubber tobacco-pouch is a splendid substitute for the desired, but unavailable, rubber gloves; dry paper may be used in the form of a newspaper, or some pages of a magazine. A rug may be caught by two opposite corners and thrown over the patient's head as a loop, and his body so pulled away from danger. If a portion of dry rope is available, it may be used in a similar manner, or a wooden walking-stick with a crook handle may be used to pull the patient away. Nothing in which there is any metal should be used, as this, of course, is an excellent conductor.

Treatment.—The patient, when removed, may be found merely to be suffering from shock, in which case he should be kept lying on the ground well covered with warm clothes. Some stimulant may be given. If the shock and collapse are severe, and the breathing is interfered with, the clothes about the neck and chest must be removed, and the patient stimulated by means of cold water on the chest and face and brisk rubbing with rough cloths. If necessary, one or other of the methods of artificial breathing should be employed to restore animation, and the patient treated as has already been fully described. Any burns, if present, must be attended to. The patient should always be seen by a physician, in case there are any further injuries.

FAINTING

Fainting, or syncope, is a temporary loss of consciousness associated with feeble action of the heart.

Causes.—The manner in which the loss of consciousness is produced appears to be that the feeble heart is unable to pump

blood up to the brain, thus causing anemia of that organ, and rendering it unable to act. If the person who threatens to faint lies down, or, still better, if she sits and then bends forward so as to bring the head below the knees, the faint is averted. The feebleness may be due to some long-standing heart disease, which through an overstrain suddenly reaches a climax. Or it may be part of the general muscular relaxation which takes place in a hot bath, fainting in a bath being sometimes a cause of death in weak persons. Powerful emotion, generally of a sorrowful nature, but sometimes even great joy, is a very common cause. Extreme pain, such as that due to the crushing of a limb, and shocks to the nervous system, such as a blow on the head or on the abdomen, are very apt to cause fainting, or even the more serious condition known as shock. Disgusting smells and sights, breathing of bad air, and general exhaustion are also causes. As a rule, a combination of these causes is necessary, except in hysterical persons and persons weak from some illness, who are specially liable to faints. Certain drugs which depress the heart's action, such as tobacco or chloroform, when taken in large amount, produce syncope.

Symptoms.—There are certain warning symptoms of fainting, such as pallor, feebleness of the pulse, a sinking feeling, and a dullness of sight and hearing. When the faint has occurred, the person lies still, breathing very faintly, with feeble pulse, pallid complexion, and often perspiration standing in drops on the face.

The faint, as a rule, lasts only a few seconds or minutes, but it may last for hours, and hysterical persons may pass from one faint, only to fall into another, several times.

Treatment.—The faint may often be prevented by attending to the cause. The person in a faint should be laid flat on the back, and care should be taken that breathing is unimpeded. If care be not taken to leave the fainting person lying flat, death may ensue, but if this be attended to, nothing more is usually necessary. Stimulants may be applied to the skin in the form of cold compresses on the head, slapping of the hands, pinching of the cheeks; or they may be applied to the nose in the form of smelling-salts or eau de Cologne, or the pungent fumes of burnt feathers.

FITS

Definite fits occur chiefly in epilepsy and hysteria. Fits very like those of epilepsy occur also in general paralysis of the insane, and sometimes in cases of brain tumor. Convulsions in children are fits not unlike those of epilepsy. Sometimes these are due to disease of the nervous system; more commonly they are due to some kind of irritation in weak or rickety children; or they may be the equivalent of a shivering fit or rigor in an adult at the commencement of some feverish attack. Tremor—a more or less constant, fine, shaky movement in the muscles of the limbs, or of any part of the body—may be seen in conditions of temporary fatigue, in exophthalmic goiter, in disseminated sclerosis (a disease of the brain and spinal cord), in chronic alcoholics or in acute delirium tremens, in old people without any definite disease, and in paralysis agitans, or the shaking palsy, in which the movements generally commence with the characteristic pill-rolling movement of the thumb and forefinger.

Treatment.—Lay the patient flat on his back, and keep the teeth separated by a pad made of cloth or some other suitable material. Sprinkle the face and chest with cold water, and endeavor to have him inhale the fumes from a smelling-salts bottle. It has also been found that by forcing common table salt into the patient's mouth quick relief has resulted.

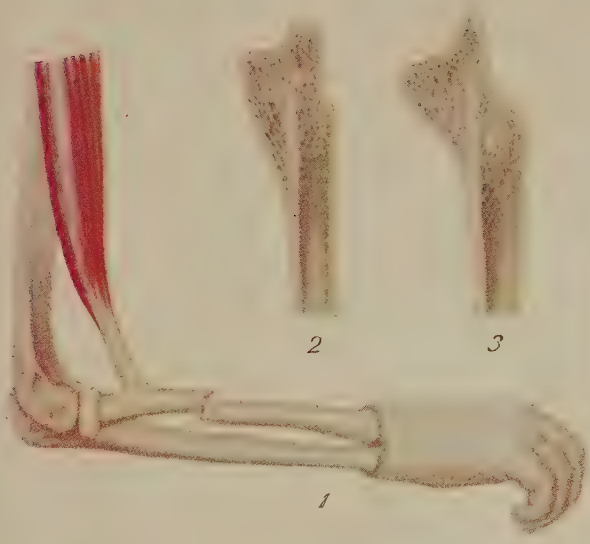
FRACTURES

Fractures are breaks in the structure of bones produced by violence.

Varieties.—The great division of fractures is into those which are simple and those which are compound.

Simple fractures form the commonest variety, consisting of those in which the bone is broken, with or without much laceration of the surrounding parts, but in which there is no wound leading from the fracture through the skin.

Compound fractures are those in which the skin is injured, so that a wound leads from the outer air to the broken bone, which may indeed protrude through this wound. The fact that a fracture is compound renders it very much more serious, even



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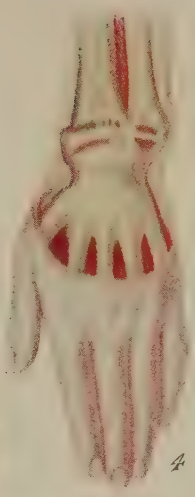

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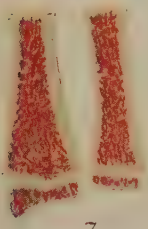

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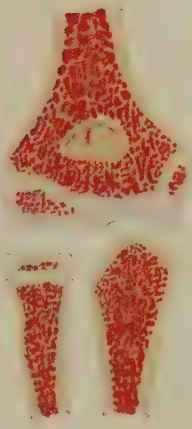

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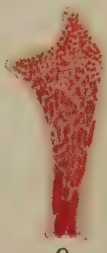

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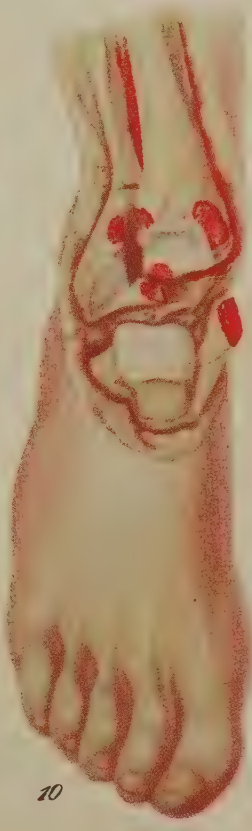

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FRACTURES OF THE BONES

FIG. 1—Fracture of the shaft of the radius, showing outward rotation of the upper fragment by the biceps and suggesting the necessity of splinting the forearm in full supination (rolling forearm outward with palm upward).

FIG. 2—Longitudinal section of lower end of radius showing Colles' fracture.

FIG. 3—Similar specimen as Fig. 2.

FIG. 4—Diagram showing the bone lesion in Fig. 5.

FIG. 5—Lateral displacement in Colles' fracture. Projection of the ulnar styloid process.

FIG. 6—Old fracture of both bones of the forearm. The bones are united by exuberant callus.

FIG. 7—Coronal section, showing the epiphyses at the lower ends of the bones of the forearm.

FIG. 8—Coronal section through the elbow joint, showing epiphyseal development of the capitellum, the internal epicondyle, and the head of the radius.

FIG. 9—Sagittal section of the ulna of a child, showing the epiphyseal cartilage in which the bony nucleus of the olecranon appears during the tenth year.

FIG. 10—Ankle joint laid open after Potts' fracture, showing points of fracture and dislocation.

FIG. 11—Oblique section showing tibial and fibular fractures of the bones of leg and outward displacement in Potts' (ankle) fracture.

though there be little splintering of the bone or laceration of the soft tissues. The special dangers attending compound fractures are as follows. The bleeding is apt to be much greater than in simple fracture, and a large quantity of blood may be lost. The union of the bone is much delayed, repair taking place by a much slower process when there is an open wound, and a lengthy illness is the result. The greatest danger, however, is that the wound may become infected with virulent microörganisms, so that suppuration, erysipelas, or blood-poisoning may ensue, and amputation of the limb may become necessary. The long illness, accompanied by suppuration, may also permanently impair the injured person's health. For all these reasons, the greatest care is necessary in handling a fractured limb, so that a simple fracture may not be converted into a compound one.

Complete fractures are those in which the bone is broken completely across, and no connection left between the pieces.

Incomplete fractures are those in which the bone is broken only partly across, or in which the periosteum, the tough membrane surrounding the bone, is not torn. This variety occurs in children, whose bones contain more fibrous material and less bone earth than those of old people, a fact which renders them tougher and more pliant in earlier life. A child's bone may, like a twig, crack half-way across and then split some distance up its length, suffering in this way what is called a "green-stick" fracture.

Fissured fractures are mere cracks in the bone, and are found most commonly in the skull. A simple fissured fracture of the skull is probably a fairly common accident.

Depressed fractures also occur generally on the skull, and consist of fractures in which a fragment of bone is forced inward below the general level. This may give rise to serious injury of the brain either when the fracture is produced, or at a later date from the thickening consequent on repair of the bone.

Complicated fractures are those in which, in addition to the fracture, some other serious injury is produced, for instance, a dislocation, tearing of a nerve, etc.

Comminuted fractures are those in which there is much splintering.

Impacted fractures are those in which, after the break has oc-

curred, one fragment is jammed inside the other, usually at an angle.

Ununited fractures are those in which, after the usual time has elapsed in which the fracture mends, it is found that union has not taken place. The failure to unite may be simply due to "delayed union," in which the process of repair is proceeding slowly on account of ill health, or of damage to the chief artery which supplies the bone with blood, or usually in consequence of the fact that the fractured limb is not kept sufficiently at rest. Or there may be actual failure of the healing process to take place. In the latter case, the ends of the bone are thoroughly rubbed together under chloroform, and the fracture again set. If this produces no good effect, an operation is usually performed, in order to remove any piece of muscle which may have got between the ends or to fasten the ends with wire.

Malunited fractures are those which have not been properly set, or in which displacement occurs after setting, so that the bone is twisted, or united with a neighboring bone, as sometimes happens after fracture of the forearm, or is enlarged and shortened, or does not unite by bone, but forms what is known as a false joint. Sometimes malunion is unavoidable, owing to spasm of muscles, or to production of an excessive amount of new bone.

Treatment.—After the fracture has been recognized, a certain amount of temporary treatment is advisable till the broken bone can be properly fixed in place by a surgeon, and in the following descriptions the temporary treatment will be given, short reference being made to the permanent treatment where it differs from the temporary.

A compound fracture is treated first of all as a wound by cleansing and by dressings, and then as a simple fracture. It is particularly necessary that the skin around should be well cleansed, and the wound itself is often very dirty. A thorough washing and scrubbing of the wound (under an anesthetic) is usually necessary, and some surgeons fasten the fragments with silver wire or plates.

For temporary treatment the splints, etc., may be applied above the clothes in the case of simple fractures, and little padding is then necessary. But for a compound fracture the limb must be exposed, the wound dressed, and then the splints

have to be carefully padded. In the permanent treatment the limb is bared, and the splints padded with absorbent cotton.

For permanent treatment the fracture must first of all be "reduced," i.e., the broken ends must be brought accurately together, then it must be "set," i.e., the ends firmly fixed in good position, and finally it must be kept at rest, with attention to the patient's general health, till union has taken place. Reduction is effected usually by one person, who pulls gently and steadily upon that part of the limb beyond the fracture (extension), so as to overcome the shortening and bring the ends a little apart from one another, in order to prevent grating, and so avoid pain. At the same time a second person should steady the limb above the seat of fracture (counter-extension). This they maintain while a third person applies the necessary splints, bandages, etc. For keeping the bone in position, various devices, such as bandages, plaster, cradles, splints of wood, leather, or poroplastic felt, and extension by weight and pulley are adopted. Splints are generally made from strips of wood, about a quarter of an inch thick, but they may be improvised from bundles of twigs, broom-handles, rifles, folded-up newspapers, and many other rigid articles. Care must be taken, especially in old people confined to bed for a fracture, that no bed-sores form, and various tonics are often necessary. In the case of fracture of the lower limbs, it is a very general practice to keep the person in bed with the limb fixed by ordinary splints for two or three weeks, and then to apply a case of plaster of Paris to the whole limb, and allow the patient to get up and go about with crutches.

HANGING

Hanging is a form of death due to suspension of the body from the neck, either suddenly, as in judicial hanging, so as to damage the spinal column and cord, or in such a way as to constrict the air-passages and the blood-vessels to the brain. Death is in any case speedy, resulting in two or three minutes, if not instantaneous, though in bygone days criminals who were "shored-up," or supported by their friends, have come round after half an hour's suspension. The mark of the noose on the neck is oblique in hanging, which serves to distinguish this form of death from strangling, in which the mark is circular. The question as to

accident, suicide, or murder does not generally arise in cases of hanging, which, apart from judicial hanging, and in the absence of any signs of a struggle, is due to suicide. The means for resuscitation of persons found hanging is similar to that for drowning.

HEMORRHAGE

Hemorrhage means any escape of blood from the vessels which naturally contain it. It may occur from a wound of the skin, in which case it escapes externally, or into some internal cavity such as the stomach or bowels, or may simply be poured out into the tissues in consequence of a blow or similar injury, but, in all cases alike, the blood escaping from the vessels is lost to the circulation. Hemorrhage is classified according to the vessel or vessels from which it occurs, as: (*a*) *arterial,* in which case the blood is bright and appears in jets or spurts, corresponding to the heart-beats; (*b*) *venous,* when it comes from veins, is dark, and wells up gradually into the wound; (*c*) *capillary,* when it flows merely from torn capillaries, and comes in a gentle ooze out of the general surface of the wound. The immediate result of a severe hemorrhage is great anemia, so that, in extreme cases, the bodily organs may be unable to continue their functions, and the person dies in consequence, with symptoms of shock.

In general, arterial hemorrhage is the most serious, and if a large artery, such as the femoral, be wounded, the person concerned may bleed to death in a few minutes. Venous hemorrhage is so easily checked by slight pressure, and the valves in the veins so effectively prevent blood from running backward in these vessels, that this form is not dangerous to life except in the case of ruptured varicose veins of the leg, or when a serious internal injury is received. Capillary hemorrhage stops so quickly, that only in the case of the disease known as hemophilia is it of serious import. The following terms are applied to hemorrhage from special sites: hematemesis, bleeding from the stomach; hemoptysis, bleeding from the lungs; epistaxis, bleeding from the nose; and hematuria, bleeding from the kidney or urinary passages. Hemorrhage is also classed as primary, reactionary, and secondary.

Natural Arrest.—When an artery of small size is cut across, the bleeding stops in consequence of changes in the wall of the artery on the one hand, and in the constitution of the blood upon the other. Every artery is surrounded by a fibrous sheath, and, when cut, the vessel retracts some little distance within this sheath, in consequence of the shortening of its muscle-fibers, and further, by the same process, the end contracts so as to form an opening of smaller size than the rest of the vessel. In the space between the end of the vessel and its sheath, and afterward for some distance up the interior of the narrowed artery, blood-clot quickly forms by the following process, and rapidly blocks the open end of the vessel. When blood is shed so as to come in contact with any surface other than the smooth lining of blood-vessels, the fibrinogen which is dissolved in its fluid becomes suddenly converted into threads of fibrine through combination with the lime salts of the blood, and the action of a ferment given off probably by the white blood-corpuscles. These threads of fibrine slowly contract and develop into a dense felt-work, in the meshes of which the corpuscles are held, and in this way a blood-clot of increasing hardness is produced, within and round the ends of the injured vessels. When an artery is only partially severed it is evident that "contraction" and "retraction" within the sheath cannot take place, and accordingly bleeding is apt to be more serious than when the vessel is completely cut across. Again, if an artery be torn across or twisted instead of cut, the opening at its end is still more narrowed, and the blood clots more rapidly on the ragged surface than it would do upon a clean cut, so that hemorrhage from a torn or bruised wound is in general much smaller in amount than from a stab or cut. The natural arrest of bleeding is usually described therefore as depending upon four factors: (*a*) the retraction and (*b*) the contraction of the cut artery; (*c*) the external and (*d*) the internal clot formed by the blood.

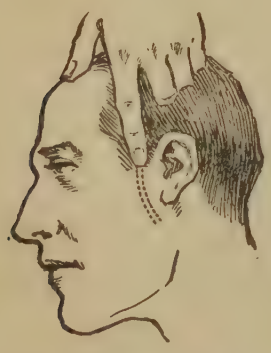
Control of External Hemorrhage.—Four main principles are applicable in the control of a severe external hemorrhage: (*a*) direct pressure on the bleeding point or points; (*b*) elevation of the wounded part; (*c*) pressure on the main artery of supply to the part; (*d*) application of substances known as styptics, which contract the vessels or aid the coagulation of the blood.

(*a*) *Direct pressure* may be made with the finger, which is the

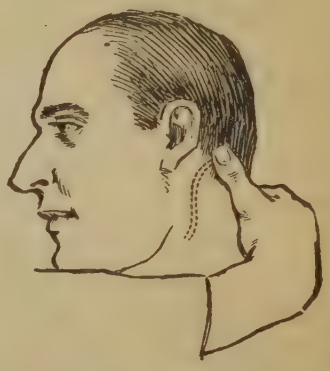
best method, when a definite bleeding spot is seen in a gaping wound. This is the method adopted at an operation by the surgeon, who places his finger at once upon any bleeding spot, afterward seizing the cut artery with forceps and tying a piece of silk or catgut tightly round its end. If the artery lie between the skin and a hard surface, as in the case of scalp wounds, a wedge-shaped pad and tight bandage (known as a "graduated compress") may be substituted for pressure with the finger, the edges of the wound being compressed between the pad and skull.

(*b*) *Elevation* of the bleeding member is an important method, the blood running off more readily by the veins, and a smaller quantity being driven into the limb the higher it is raised. This method is applicable, of course, only in cases of bleeding from the hand or foot.

(*c*) *Pressure upon the main artery* of supply to the injured limb is a certain method of stopping the circulation and consequently all bleeding much after the manner of stopping the water-supply of a district by closing the main pipe. At certain points where the arteries lie close to bones and near the surface, the pulsation of the vessel may be felt, and *pressure with the finger* over the artery serves to obliterate it against the bone, the points where this may be adopted being as follows.



In cases of bleeding from the upper part of the scalp, the temporal artery may be felt and compressed immediately in front of the upper part of the ear.



For wounds at the back of the head, the occipital artery can be felt and compressed a short distance behind the mastoid process, the bony prominence at the back of the ear.

Bleeding from the face may be checked by pressure on the facial artery, which passes on to the face about an inch in front of the angle of the jaw, across the jaw-bone, against which it is to be pressed.

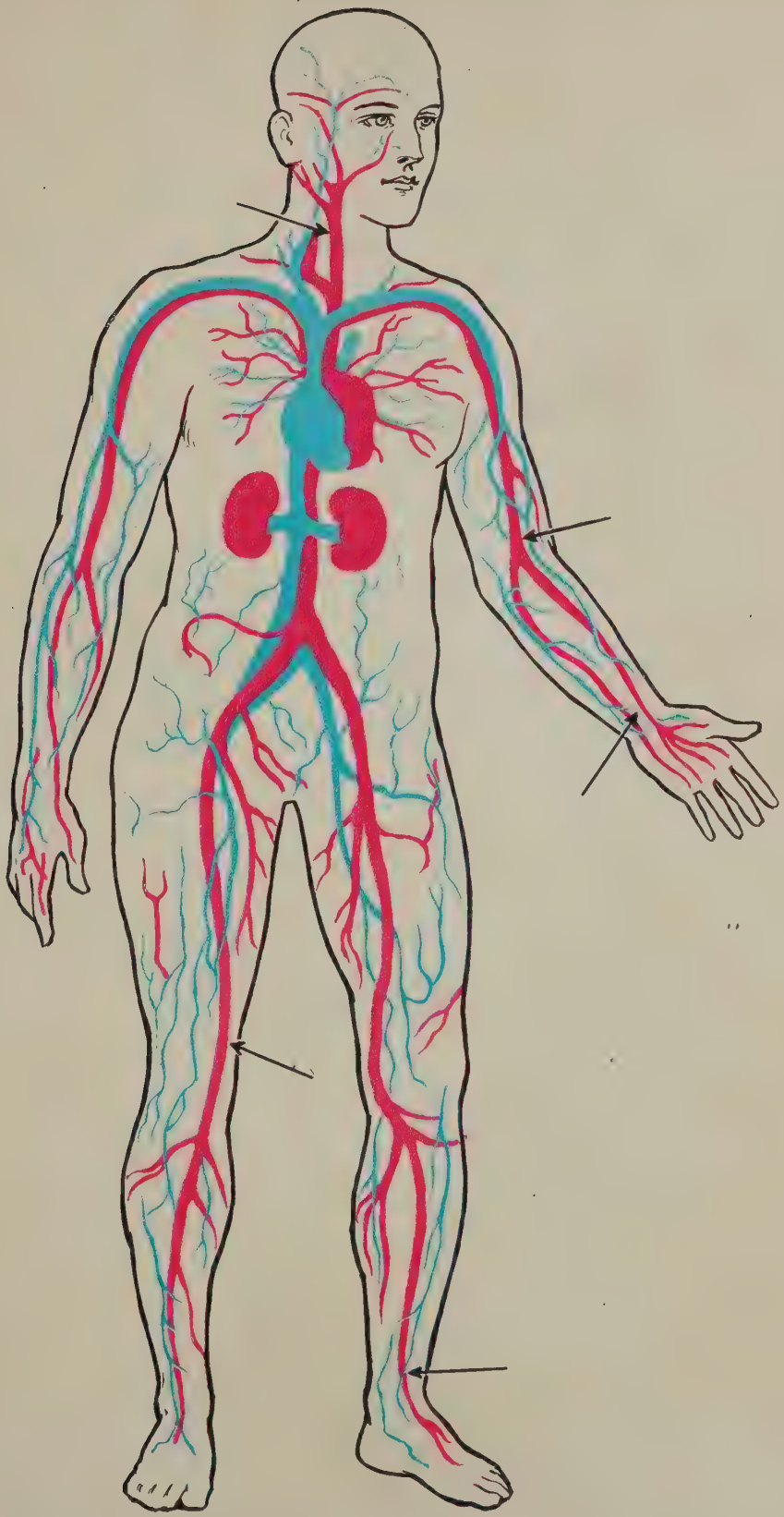
All bleeding from the head and neck may be lessened by pressure upon the common carotid artery in the neck a short distance below the prominent Adam's apple, and between it and the edge of the large sternomastoid muscle. In this groove, the artery is pressed straight back against the transverse processes of the spinal column.

Bleeding from the region of the shoulder and armpit is checked by pressure on the subclavian artery, the pressure in this instance being applied with the thumb directly downward in the hollow behind the middle part of the collar-bone, so as to press the artery down upon the first rib, thus checking the bleeding.

Bleeding from the region of the elbow or forearm may be controlled by feeling for the brachial artery on the inner side of the upper arm, behind the biceps muscle, and pressing the artery against the arm-bone.

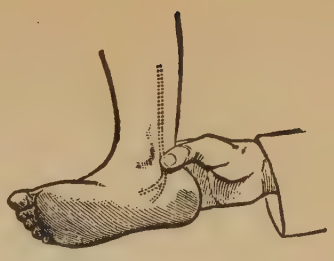
Bleeding from the hand is checked by pressure on the radial artery, where it lies between the skin and radius in front of the wrist, and on the ulnar artery just before it enters the hand near its inner margin.

In the lower limb the arteries lie deep among the muscles, but bleeding from any part of the limb may be checked by pressure backward on the femoral artery, which is to be felt pulsating in the center of the groin, and which is compressed against the head of the thigh-bone.



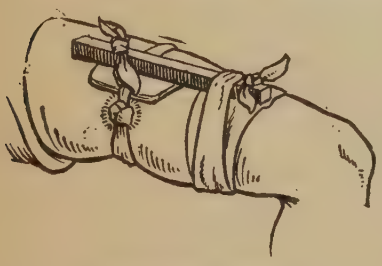
Bleeding can be stopped by pressure on the arteries
as indicated by the arrows

Bleeding from the sole of the foot may be controlled by pressure on the posterior tibial artery, which lies about half an inch behind the inner ankle.



Another method for applying pressure on the main artery consists in *forced flexion* at the elbow, hip, or knee, as the case may be. A pad is placed in the bend of the joint, which is then flexed as completely as possible and firmly bound in this position, the artery being thus sharply bent upon itself.

Still another method for control of the main blood-supply is by the *tourniquet,* which consists of an elastic band or ligature passed round a fleshy part of any of the limbs, and pulled or twisted tight. A surgical tourniquet consists of an india-rubber cord or band with an arrangement for fixing the ends together, or of a strap with buckle and a screw appliance for tightening it up. A tourniquet may, however, be improvised from a piece of rope, or a handkerchief folded cravatwise, tied round the limb and then twisted up tight by a piece of wood, large key, or similar object introduced beneath it.



Tourniquet for leg.

The handle of such a tourniquet is prevented from untwisting by passing a second band round the limb and including the end of the handle within it before tying. A tourniquet may be applied to the fleshy part of thigh, leg, upper arm, or forearm. The application of a tourniquet is slightly painful, but this may be almost entirely prevented by raising the limb before it is applied, in order to empty the veins of blood.

Occasionally, when bleeding is continuous or when it is from a deep-seated wound like a stab, or injury to the root of the tongue, it is impossible to get at the bleeding spot, and permanent control of the bleeding is only to be achieved by the surgeon, who cuts down upon the main artery of supply and ties a ligature round it.

(*d*) *Styptics* are applied when the bleeding is a general ooze from a wound, or when the bleeding comes from an inaccessible position, such as the interior of the nose or a wound in the side. The most important styptics are heat and cold. Though moderate warmth greatly increases bleeding, ice-cold water and also water between 115° and 120° F. (i.e., a temperature which the hand can hardly bear) both favor clotting and contract the blood-vessels. Heat is much more effectual than cold, if applied directly to the wound. Various drugs, such as perchloride of iron and hazeline, act similarly. Extracts made from the suprarenal glands of sheep and known by various names, such as adrenalin, renaglandin, suprarenalin, have a most powerful action in contracting vessels and stopping bleeding, being now much used in surgery.

Control of Internal Hemorrhage is not to be so certainly achieved as in the case of bleeding from the vessels of the limbs. There are certain general principles to which it is most important to adhere. Chief among these is the maintenance of the recumbent position, since the heart beats less forcibly and the blood-pressure is consequently lowered as soon as the injured person lies down. For the same reason, all excitement must be avoided, and the mind of the sufferer quieted as far as possible. Stimulants must, above all, be avoided; and if the person shows a disposition to faint, this is a healthy symptom, as the circulation during a faint becomes still weaker, and the bleeding therefore slackens. Ice-bags or compresses wrung out of cold water may be laid over the chest or stomach, according to the origin of the hemorrhage. Various drugs are administered, such as morphia, by hypodermic injection, for its quieting effect; gallic acid when the bleeding is from the kidneys, the organs by which this drug is excreted; adrenalin when the bleeding is from the stomach, into contact with which the drug comes at once; and volatile oils, like turpentine and camphor, which are said to favor clotting by rapidly increasing the white corpuscles of the

blood, when the hemorrhage is from the lungs. Styptics are of special use in bleeding from the bowels or womb. In the former case, gallic acid or perchloride of iron is given by the mouth, or injected into the bowel if the site of the bleeding is low down. In the hemorrhage which sometimes follows childbirth, vaginal douches of hot water form one of the usual means employed, or plugs of absorbent cotton steeped in tincture of perchloride of iron or adrenalin solution are introduced, and these, combined with pressure, seldom fail to arrest the bleeding.

It should be mentioned that in operations on internal organs or other highly vascular tissue, in the case of which bleeding would be very hard to stop, the cautery is often used instead of the knife, and not only removes the part desired, but, by its heat, prevents all bleeding.

Treatment of Bleeding from Special Sites.—*Nose.*—Keep quiet, lying or sitting; loosen collar; no blowing of nose; cold key or sponge to neck; if these be not successful, plugging of nostrils with lint soaked in tincture of perchloride of iron or adrenalin.

Tongue.—Ice to suck; pressure with the fingers; if serious, compression of carotid artery.

Face or Scalp.—Direct pressure with fingers or bandage and pad on wound; if bleeding be severe, pressure in addition on facial, temporal, or occipital artery.

Neck.—Pressure on carotid artery.

Armpit or Shoulder.—Pressure applied to the subclavian artery.

Forearm.—Pressure on brachial artery by fingers, tourniquet, or forced flexion at elbow.

Hand.—Elevation and direct pressure with pad and bandage; if bleeding be severe, pressure on radial and ulnar arteries, or tourniquet to forearm.

Thigh.—Pressure on femoral artery at groin; tourniquet, if low down.

Leg.—Tourniquet to thigh, or forced flexion at knee. In the case of ruptured varicose veins a pad and bandage applied round the leg and extending above and below the wound will be found sufficient.

Foot.—Direct pressure and elevation; if bleeding be severe, forced flexion at knee, or pressure on posterior tibial artery.

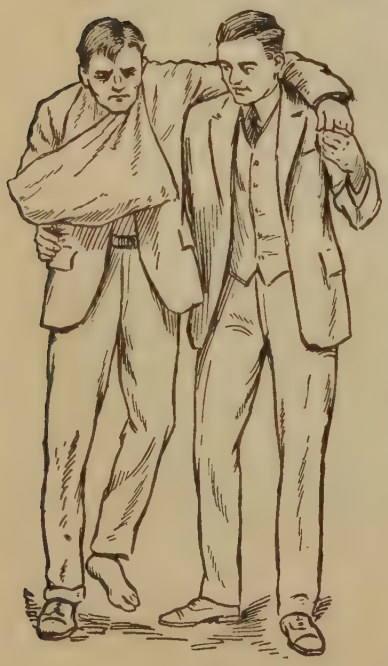
LIGHTNING STROKE

This is a comparatively rare occurrence, but is of such a nature that anyone may find himself face to face with a case. In the severer cases the victim is killed on the spot, being much charred and burned; in the less severe instances, he suffers from shock, and may exhibit burns of varying degree and size on his body. The treatment is on the same lines as in the case of electric shock, except that there is no danger in approaching the patient freely. The same means of restoring animation must be employed, and, if necessary, artificial respiration.

A doctor should always be summoned to see the patient, as there may be damage of a nature not readily recognized.

Prevention.—When out in a thunderstorm people should keep as much as possible in the open, avoiding the dangerous shelter offered by trees, etc. Keep away from any obvious conductor along which a flash of lightning would be likely to pass, having been attracted to it. If in a house, it is a good plan to close the windows and keep well away from the fire.

REMOVING THE INJURED



A knowledge of the manner in which injured persons may best be removed from the spot where they have sustained the injury is of great importance, because careless or unskilful handling or moving may produce much pain and in some cases is liable to aggravate the bodily damage already done.

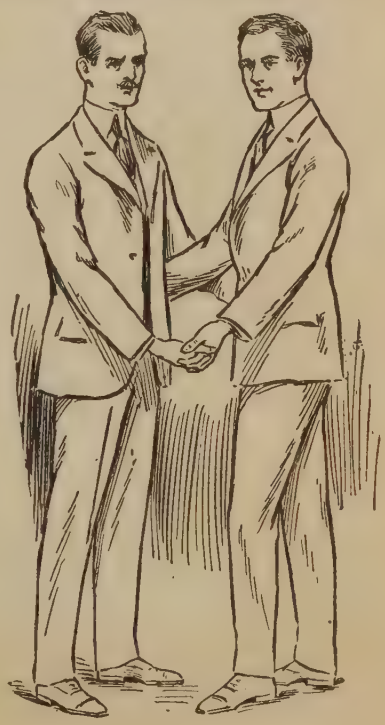
The method of removal depends upon how many persons are available as bearers, and the degree of assistance required by the patient.

By one bearer.—When an arm is injured the patient is usually quite able to walk, and, the arm being suitably supported, the bearer

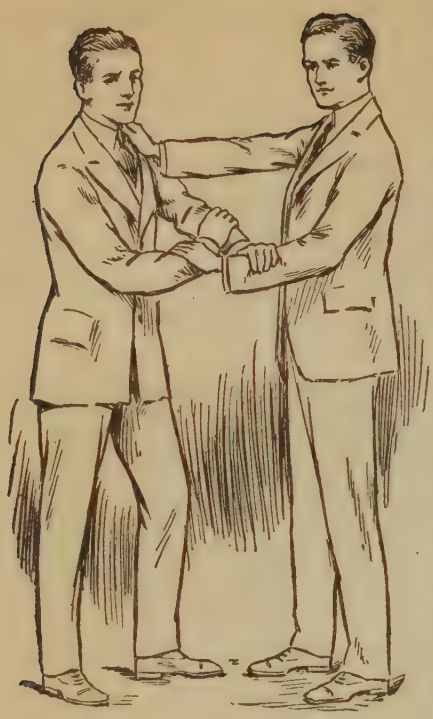
draws the patient's sound arm *over his shoulders* and places his own arm round the patient's waist.

If the bearer be strong and the patient seriously incapacitated, the latter may be carried *in the bearer's arms,* the right one passing beneath the patient's shoulder-blades, the left beneath the upper part of the thighs; in this case the patient should be carried high and supported as much upon the bearer's chest as by his arms. In other cases the patient may be carried *upon the bearer's back,* his arms round the bearer's neck and his legs under the bearer's arms.

In cases of complete unconsciousness, where the dead-weight of the patient's body must be raised and borne by one bearer, the method known as the *fireman's lift* is applicable. The patient is turned on his face, arms by the sides; the bearer stands at the patient's head, and, passing his hands beneath the latter's shoulders, raises him to a kneeling posture. The bearer next slides his hands under the patient's armpits and raises him still further; then stooping and pushing his head between the patient's right arm and his body, he allows the patient's body to fall over his right shoulder upon his back, while the patient's right arm comes round the bearer's neck and is steadied temporarily by his left hand. Finally, the bearer, passing his right arm round one or both thighs of the patient, grasps the patient's right wrist with his right hand, and bringing the weight of the body well on to the center of his own back, rises to the erect position.



By two bearers with hand seats.—If the patient is suffering from such a condition as an injured foot and is able to give some assistance, and if there are two bearers, the bearers divide his weight by means of one of the forms of hand seats, of which the two-handed seat is the most useful. If the patient be more seriously injured, some form of stretcher



must be obtained or improvised as described below.

For the *two-handed seat* the bearers face each other, the one on the right interlocking the fingers of his right hand with those of the left hand of the other bearer; each places his disengaged hand behind the patient or on the other bearer's hip or shoulder. In lifting the patient, they kneel at his sides, each upon the knee nearest to his feet, and, forming the seat beneath his thighs, they rise together supporting him, while he assists, if possible, by putting his arms round their necks.

For the *three-handed seat,* the right-hand bearer grasps his own left forearm. The left-hand bearer places his right hand upon the shoulder of the other, and grasps the right forearm of the other with his left hand, his left forearm at the same time being grasped by the left hand of the other bearer.

For the *four-handed seat,* each bearer grasps his own left wrist with his right hand; each then clasps the disengaged right wrist of the other with his left hand. To carry a patient by the three-handed or four-handed seat the patient must stand up, and the bearers, stooping, form the seat behind him.

If a patient be absolutely helpless and it is urgently necessary to carry him quickly for a short distance only, the *fore-and-aft carry* may be used. One bearer stands at the patient's head and

passes his hands behind the shoulders into the armpits, while the other bearer stands between the patient's legs, facing toward his feet, and takes one leg under each arm.

By help of a stretcher.—If the patient be unable to walk or to sit upright in the conditions above described, a stretcher must be obtained. If no regular canvas stretcher be at hand, a satisfactory one may be improvised from a pair of poles six or seven feet in length and a couple of coats with the sleeves turned outside in. The coats are buttoned over the sleeves, through which the poles are then passed. Or a blanket may be used, two poles, rifles, or similar objects being laid upon it about twenty inches apart, and the ends and sides of the blanket being then successively folded over them. Various other articles, such as a light sofa or a window-shutter, or a blanket supported by four people, one at each corner, may also be used.

The patient, having received suitable first-aid treatment, is lifted on to the stretcher as follows:

When there are four bearers (referred to as Nos. 1, 2, 3, and 4), the first three place themselves on the left side of the patient, and No. 4 on his right; No. 1 is opposite his knees, Nos. 2 and 4 are opposite his hips, and No. 3 is opposite his shoulders. All kneel on the left knee, facing the patient, and take hold of him as follows: No. 1 passes his hands and forearms beneath the patient's legs, the hands wide apart. Nos. 2 and 4 pass their hands and forearms beneath the patient's hips and loins. No. 3 passes his left hand across the patient and under his right shoulder, the right hand beneath the left shoulder of the patient. All then lift the patient off the ground and rest him upon the right knees of Nos. 1, 2, and 3. No. 4 disengages, gets the stretcher, places it directly beneath the patient, and again assists in supporting him as he is lowered gently on to the stretcher. The patient is lifted off the stretcher in precisely the same way.

SUNSTROKE

Sunstroke, heat-stroke, etc., are terms applied to the effects produced upon the central nervous system, and through it upon other organs of the body, by exposure to the sun or to overheated air. Although most frequently observed in tropical regions, this

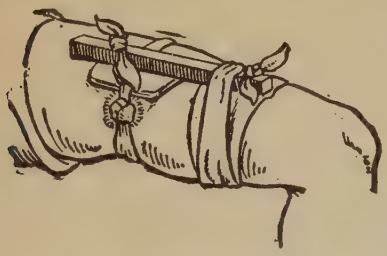
condition occurs also in temperate climates during hot weather. A moist condition of the atmosphere, which interferes with cooling of the overheated body, greatly increases the liability to suffer from this ailment.

Treatment.—Means should be adopted to prevent attacks in the case of those who must necessarily be exposed to the sun. These consist in the wearing of loose clothing, and of a suitable helmet with protection to the neck and back, in due attention to the function of the skin, and in the avoidance of alcoholic and other excesses. Cold water may be drunk in small quantities at frequent intervals. Sleeping in the open air in very hot seasons is recommended. The treatment of a patient suffering from an attack necessarily depends upon the form it has assumed. In all cases he should, if possible, be at once removed into a shaded or cool place. Where the symptoms are mostly those of syncope and there is a tendency to death from heart-failure, rest in the recumbent position, the use of diffusible stimulants, such as aromatic spirits of ammonia, ether, etc., together with friction applied to the extremities, are the means to be adopted. Where, on the other hand, the symptoms are those of apoplexy or of very high fever, by far the most successful results are obtained by the use of cold (by pumping cold water over the head, neck, and back, the cold affusion, rubbing the surface with ice, or enemata of ice-cold water). The effect is a marked lowering of the temperature, while at the same time a stimulus is given to the respiratory function. Should the temperature be lowered in this way but unconsciousness still persist, removal of the hair and blistering a portion of the scalp are recommended. The subsequent treatment will depend upon the nature of the resulting symptoms, but change to a cool climate is often followed by marked benefit, in cases which show chronic effects of the sunstroke.

TOURNIQUET

A tourniquet is an instrument used for the temporary stoppage of the circulation in a limb, so that bleeding may be controlled. There are various forms of tourniquet, the simplest being a *tourniquet improvised* from a band such as that made by a handkerchief folded cravatwise, tied round the limb, and then

twisted up by means of a rigid object passed beneath it as seen in first illustration.



Tourniquet for leg.

Tourniquet for arm.

Two simple forms of tourniquet. The first is an improvised tourniquet, the knot being over the femoral artery, and the lower band being intended simply to keep the handle of the tourniquet from unwinding; the second represents Esmarch's elastic-band tourniquet.

Petit's tourniquet has a linen strap passing over two pairs of brass rollers, which can be separated from one another by a screw, thus tightening the strap after it has been buckled round the limb.

Esmarch's tourniquet, as shown in the second illustration, consists of an elastic band which is wrapped with moderate tightness round the limb, and then prevented from unwrapping by tapes. It is the form generally used.

In applying a tourniquet for bleeding, it must be rendered sufficiently tight to stop the circulation completely. Otherwise, if the veins only be compressed and the arteries still open, the bleeding is made worse. A tourniquet must not be left in position longer than is absolutely necessary, or else gangrene of the limb may result.

UNCONSCIOUSNESS

Unconsciousness is a condition depending usually on some disorder of the brain, and may be of various degrees.

Varieties.—Sleep is a natural form of unconsciousness due to a resting condition of the brain, and when the brain remains irregularly active various peculiar forms of unconsciousness or of disturbed consciousness are apt to ensue, such as delirium, somnambulism, hypnotism, catalepsy, ecstasy. In syncope or fainting, the brain ceases to act for a time in consequence of a bloodless state, brought on by feebleness of the heart's action. In the lesser forms of epilepsy, the epileptic sometimes becomes

unconscious of his surroundings, though able to perform such a simple act as to take off his clothing, or to run some distance, or even to attack another person.

Stupor is the name given to a partial state of unconsciousness from which the person can be roused for a moment by some powerful stimulus such as a pinch or a shout.

Coma means a condition of complete oblivion to external things very near to death.

Causes.—Fainting, as already stated, is due to deficient supply of blood to the brain, and anything which brings this about may cause a faint. Among injuries to the brain, apoplexy, compression, and concussion of the brain and inflammation affecting the brain or its membranes are the chief causes. Epilepsy is also a cause of passing unconsciousness either accompanied by a fit, or, in the slighter forms, without any such seizure. Narcotic poisons, chief among which stands opium, and drugs of the class to which alcohol and chloroform belong, also produce stupor. The poisons that accumulate in the blood during various diseases, such as Bright's disease and diabetes, may produce coma before they lead to death, though in many cases the state of dulled consciousness that precedes death is due simply to gradual waning of the vital powers.

Treatment.—It is of the utmost importance to determine the cause of unconsciousness before proceeding to treat any given case. Fainting brings with it its own cure, and little is necessary beyond leaving the unconscious person recumbent. Unconsciousness due to compression of the brain, resulting from some severe injury to the head, demands careful watching and often requires the energetic treatment of trephining the skull in order to remove blood-clots, ligature torn blood-vessels, etc. The unconsciousness of uremia due to Bright's disease is perhaps the form most liable to be mistaken or overlooked, but doubts as to this are set at rest by examination of the urine.

WOUNDS

A wound is any breach suddenly produced in the tissues of the body by direct violence. An extensive injury of the deeper parts without corresponding injury of the surface is known as a bruise or contusion.

Varieties.—Classified according to the immediate effect produced, four varieties are usually described, viz., *incised, punctured, lacerated,* and *contused.*

Incised wounds are usually inflicted with some sharp instrument, and are clean cuts, in which the tissues are simply divided without any damage to parts around. The bleeding from such a wound is apt to be very free, but it can be readily controlled.

Punctured wounds or stabs are inflicted with a pointed instrument. These wounds are perhaps the most dangerous, partly because their depth involves the danger of wounding vital organs, partly because bleeding from a stab is hard to control, and largely on account of the difficulty of purification. The wound produced by the modern nickel-nosed bullet is a puncture, much less severe than the ugly lacerated wound caused by an expanding bullet or by a ricochet, and if no clothing has been carried in by the bullet, the wound is clean and usually heals at once.

Lacerated wounds are those in which great tearing takes place, such as injuries caused by machinery. The blood-vessels being torn and twisted, little bleeding is apt to result, and a limb may be torn completely away without great loss of blood. Such wounds are, however, specially liable to the danger of suppuration.

Contused wounds are those accompanied by much bruising of surrounding parts, as in the case of a blow from a cudgel or poker. In these wounds also there is little bleeding, but healing is slow on account of damage to the edges of the wound.

Any of these varieties may become infected by pus-forming germs and develop into a *poisoned wound.*

First-aid Treatment.—The first duty of a bystander who renders help to a wounded person is to check any bleeding. This may be done by pressure upon the wound with a clean handkerchief, or, if the bleeding is serious, by putting the finger in the wound and pressing it upon the spot from which the blood is coming.

If a doctor is to see a wound within a few hours, it should not be interfered with further than is necessary to stop the bleeding and to cover the wound with a clean dry handkerchief or piece of lint. In cases where expert assistance is not soon obtainable, one of the following procedures may be adopted. The bleeding

being checked, the next step is to cleanse the wound and surrounding skin.

This may be done:

(*a*) *By painting freely with tincture of iodine* the wound and the surrounding skin, and covering with a piece of clean dry lint; this answers well in the case of small wounds and abrasions.

(*b*) *By washing with clean water* (preferably boiled). For this purpose, one requires two *clean* bowls scalded out quickly with boiling water and filled with *clean* warm water; also several *clean* cloths, which may be handkerchiefs, squares of lint (preferably boracic lint), or newly washed rags.

(1) First, it is essential that the person who is to dress the wound should wash his own hands, and especially the nails, thoroughly with soap and water.

(2) Press a clean cloth upon the wound to prevent the entrance into it of dirty water, and carefully wash the skin around the wound with water from one of the bowls, using soap if necessary.

(3) Wring out a fresh cloth from the clean water in the second bowl, and with it gently dab the wound. Remove, replace by another clean cloth similarly wrung out, and fix with a folded handkerchief.

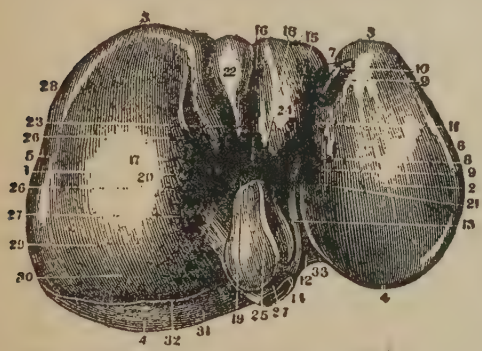
(4) The injured part is finally fixed so that movement is prevented or minimized. A wounded hand or arm is fixed with a sling, a wounded leg with a splint.

(5) If the injury has caused severe shock, stimulants may be necessary.

THE LIVER AND ITS DISEASES

THE liver is a solid organ of dark brown color, forming the largest gland in the body. It discharges, in all probability, several functions, acting both as an excreting organ and as an elaborator and storehouse of nourishment, but, though much experimental work has been done with regard to it, its working is still but vaguely understood.

Form.—The shape of the liver is generally described as that of a right-angled triangular prism, with the right angle rounded off. It has five surfaces, upper, lower, front, back, and right, of which the front and back surfaces are triangular, with the base toward the right side and tapering off to the left. The surfaces



THE INFERIOR OR CONCAVE SURFACE OF THE LIVER, SHOWING ITS SUBDIVISIONS INTO LOBES

1. Center of the right lobe.
2. Center of the left lobe.
3. Its anterior, inferior, or thin margin.
4. Its posterior, thick, or diaphragmatic portion.
5. The right extremity.
6. The left extremity.
7. The notch on the anterior margin.
8. The umbilical or longitudinal fissure.
9. The round ligament or remains of the umbilical vein.
10. The portion of the suspensory ligament in connection with the round ligament.
11. Pons hepatis, or band of liver across the umbilical fissure.
12. Posterior end of longitudinal fissure.
13. } Attachment of the obliterated
14. } ductus venosus to the ascending vena cava.
15. Transverse fissure.
16. Section of the hepatic duct. ,,
17. Hepatic artery.
18. Its branches.
19. Vena portarum.
20. Its sinus, or division into right and left branches.
21. Fibrous remains of the ductus venosus.
22. Gall-bladder.
23. Its neck.
24. Lobulus quartus.
25. Lobulus Spigelii.
26. Lobulus caudatus.
27. Inferior vena cava.
28. Curvature of liver to fit the ascending colon.
29. Depression to fit the right kidney.
30. Upper portion of its right concave surface over the renal capsule.
31. Portion of liver uncovered by the peritoneum.
32. Inferior edge of the coronary ligament in the liver.
33. Depression made by the vertebral column.

are separated from one another by rounded margins, except in the case of the lower surface, which is divided from the right, front, and upper surfaces by a sharp edge. This edge in the living body can be felt rising and falling with respiration if the hand is pressed upon the upper part of the abdomen, a little below the margin of the ribs, toward the right side of the abdomen. The organ is divided also into five lobes. The great bulk of it constitutes the right lobe; the left lobe is small and extends a little way into the left half of the abdomen, to end in a sharp left border, while the Spigelian, quadrate, and caudate lobes are three small divisions upon the back and under surface. About the middle of the under surface, toward the back, is placed the transverse fissure, or portal fissure, by which the hepatic artery and portal vein carry blood into the liver, and by which the right and left hepatic ducts emerge, carrying off the bile formed in the liver. The gall-bladder is attached to the under surface of the right lobe and projects from beneath the lower margin, where, if distended, it can be felt during life as a rounded swelling immediately beneath the end of the ninth rib. The connection of the gall-bladder, in which bile is stored, with the liver is rather complicated. The hepatic ducts emerge, as stated above, at the transverse fissure, one coming from the right and one from the left lobe. They immediately join, and the single hepatic duct, which is about an inch long, joins the cystic duct, coming from the gall-bladder, at an acute angle. The hepatic and cystic ducts by their union form the common bile-duct, which is about three inches in length, and opens into the small intestine. Bile, which passes down from the liver by the hepatic duct, may either pass directly into the common bile-duct and so into the intestine, or it may pass upward through the cystic duct into the gall-bladder, to be stored there, and later retrace its way through the cystic duct to the bile-duct, and so to the intestine. The cystic duct and gall-bladder, therefore, together form a *cul-de-sac* upon the bile-passages.

Position.—The liver occupies the right-hand upper portion of the abdominal cavity. Its upper surface is in contact with the diaphragm, which also separates its right surface from the right lower ribs. About four-fifths of the organ lies to the right of the middle line of the body. As it is of a rounded shape it fills up the dome of the diaphragm, the lower part of the right lung be-

ing hollowed out to receive the liver, from which it is separated only by the diaphragm and pleural membrane. The liver, in turn, rests upon various abdominal organs, the right kidney and suprarenal body, the large intestine, the duodenum, and the stomach all making impressions upon it, and helping to support its weight. In addition, the liver is swung from the walls of the abdomen by five ligaments, four of which consist of thickened parts of the peritoneal membrane lining the whole abdominal cavity, and reflected from the upper part of the liver to its walls. These are the coronary ligament, right and left lateral ligaments, falciform ligament, and a dense fibrous cord, the round ligament.

Dimensions.—The vertical thickness of the liver amounts, toward the right side, to over five inches, and its extent from side to side is rather more. Its weight is over fifty ounces, varying with the size of the person, but making up about $\frac{1}{36}$ or thereabout of the whole body-weight. In young children it is relatively much larger, accounting, to a large extent, for their protuberant abdomen, and making up about $\frac{1}{18}$ of the whole body.

Vessels.—The blood-supply of the organ differs from that of any other part of the body, in that the blood collected from the stomach and bowels into the portal vein does not pass directly to the heart, but is distributed to the liver, in the substance of which the portal vein breaks up into capillary vessels. The effect of this is that some harmful substances, absorbed from the stomach and bowels, are abstracted from the blood-stream and destroyed, while various constituents of the food are stored up in the liver for gradual use. In addition, the liver receives a large hepatic artery from the celiac axis, which also distributes branches to the stomach and pancreas, this blood-supply serving to nourish the organ. After the blood has circulated through capillaries, it is collected together from both sources and emptied into the hepatic veins, which pass directly from the back surface of the liver into the inferior vena cava.

Minute Structure.—The liver is enveloped in a capsule of fibrous tissue, Glisson's capsule, from which strands run in along the vessels, and, penetrating to the farthest recesses of the organ, bind its structure together. The hepatic artery, portal vein, and bile-duct divide and subdivide, the branches of each lying alongside corresponding divisions of the other two, till the finest divisions of artery, vein, and bile-duct, known as interlobu-

lar vessels, lie between the lobules, of which the whole gland is built up. These lobules, each of about the size of a small pinhead, form, each in itself, a complete secreting structure, and the liver is built up of many hundred thousands of such exactly similar lobules.

A lobule has the following structure. From the small vessels lying round its margin, capillaries are given off, which run in toward the center of the lobule, where they empty into a small central vein. These central veins from neighboring lobules collect together, and ultimately the blood passes into the hepatic veins, and so leaves the liver. Between the capillaries, which radiate from the central vein to the edge of the lobule, lie rows of large liver-cells, these forming the distinctive tissue of the organ, upon which its activity depends. Between the rows of cells also lie fine bile capillaries, which collect the bile produced by the cells and discharge it into the bile-ducts lying along the margins of the lobules. The liver-cells are among the largest cells in the body, and each contains one or two large, round nuclei. In the cells can often be seen droplets of fat or granules of glycogen or animal starch.

Functions.—The liver has, so far as is known at present, three chief functions. The best known of these is the formation of bile, which constantly trickles from the bile-duct into the intestine, and is secreted in large amount when food is taken into the stomach, and again when the food is expelled from the stomach and passes down the intestine. From this it would seem as if the bile were concerned in digestion, but the only digestive action which it has been found to possess is to aid the pancreatic juice in breaking up the fat of the food. It is, therefore, generally regarded rather in the nature of an excretion of waste material than of a fluid intended to subserve useful ends. Bile consists mainly of salts of two complex organic acids (taurocholic and glycocholic acids), bile pigments, mucus, and water, in addition to small quantities of fats, soaps, cholesterine, and mineral salts. The pigment which gives its characteristic yellow or green color to the bile is of interest, because it is derived from the hemoglobin of the blood, thus proving that, in the liver, worn-out blood-corpuscles are broken down. The cholesterine, found in varying amount, is the substance from which gallstones are usually formed.

The second important function of the liver is the formation of waste substances from the used-up tissues of the body, notably of urea and uric acid, which find their way into the blood and are excreted by the kidneys.

The third function was discovered by Claude Bernard, and named by him the "glycogenic function." When large quantities of sugar and starch are eaten, digested, and absorbed, instead of passing at once into the general circulation, which would throw a surplus of nutriment upon the tissues a short time after meals, and in the intervals leave them destitute, the sugar formed from these foods is carried by the portal vein to the liver, and there deposited for future use in the form of glycogen, or animal starch. This substance is speedily produced after a meal of vegetables or sugar, and if an animal be killed some time after such a meal and its liver examined, the liver-cells are found crowded with granules of glycogen. This glycogen is either converted once more, as it is needed, into sugar, and so absorbed by the blood, or it combines with substances in the blood, being, in any case, carried off to the muscles and other active organs.

DISEASES OF THE LIVER

The liver is a comparatively passive organ, and may be extensively diseased without any very urgent symptoms, unless the circulation through it be impeded, the outflow of bile checked, or neighboring organs implicated. Jaundice, which is a symptom of several liver disorders, is treated of elsewhere. Dropsy, which may be caused by interference with the circulation through the portal vein of the liver, as well as by other causes, is also considered separately. The presence of gall-stones is a complication of some diseases connected with the liver. Diabetes in some cases is due to changes in the liver.

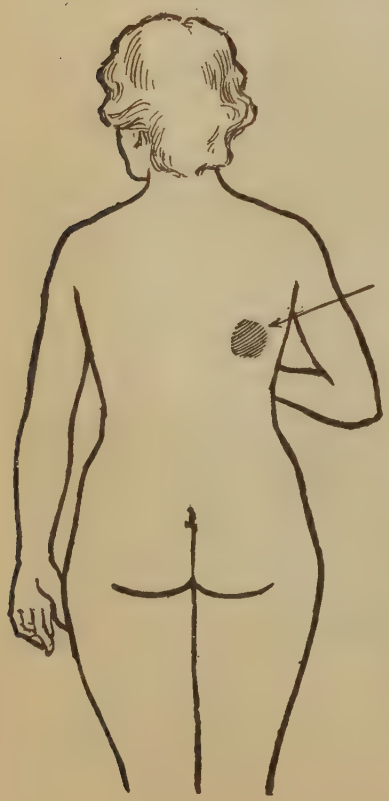
INFLAMMATION OF THE LIVER

This is not a common condition in temperate climates, but in hot countries, and particularly in India, it gives rise to the condition popularly known as "tropical liver," which is of great

importance because of the frequency with which Europeans, who have been resident in that country, are affected by it.

Causes.—The cause which renders white people in India so specially liable to inflammation of the liver, is the failure to adapt their habits as to food, drink, and exercise to the new conditions under which they live. Persons who eat the same rich food that can be tolerated or is necessary in a cold climate, those who fail to take exercise in the cooler parts of the day, and, above all, those who drink strong alcoholic liquors in large quantity, are prone to suffer. Two diseases also lead very specially to inflammation of the liver, viz., malaria and dysentery, the latter of which not infrequently produces abscess. It is said that inflammation of the liver was three times as frequent twenty years ago as it is to-day in India, and this is attributed partly, no doubt, to better modern hygienic conditions and largely to the fact that the heavier wines and stronger spirits are less indulged in now than formerly.

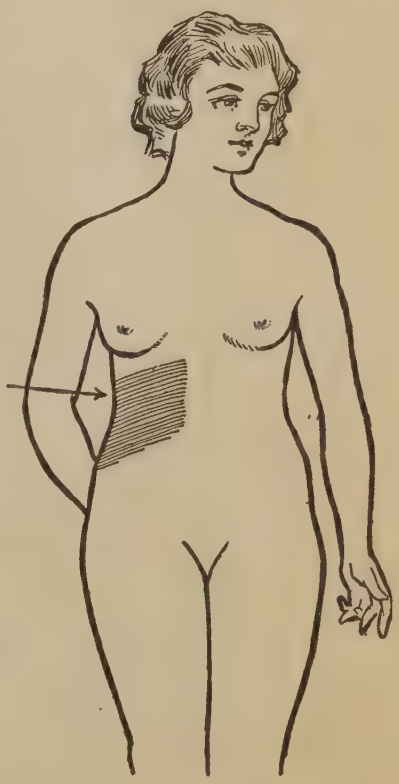
Symptoms.—There are various degrees and types of this disorder. In the first place, the condition may amount only to a passing acute attack, from which the patient recovers perfectly, or, after numbers of these attacks, the liver may become permanently damaged and the condition chronic. On the other hand, particularly as a result of dysentery, an abscess or abscesses may form and give rise to a dangerous condition.



In the acute attacks, feverishness, tenderness over the site of the liver, and pain extending up to the right shoulder (as shown in the shaded area of the accompanying figure), together with digestive derangements, such as furred tongue, loss of appetite, and constipation, are the chief symptoms. The condition is rarely fatal, and, after some days' illness, recovery usually takes place.

When the condition has become chronic, the liver is permanently enlarged and painful, the bowels are costive, and sleeplessness and loss of appetite cause much annoyance. Piles are almost always troublesome, in consequence of the interference with circulation in the liver. The face of such a person has a very typical appearance, the skin being jaundiced and earthy-looking, and the whites of the eyes yellow; his temper is always irritable, and he suffers not infrequently from great mental depression. If the habits of such a person have been very intemperate and cirrhosis of the liver be present, the condition becomes much worse, and may, before long, end fatally.

Treatment.—In the acute attacks, rest in bed, a very simple diet, and avoidance of all alcoholic liquors are the essentials. Counter-irritation over the liver by a mustard plaster applied over the area as designated by the accompanying figure, or painting the space with iodine, gives great relief. A smart saline purge of phosphate of soda or some aperient water in the morning, or a blue pill at night is also of importance, and, as the condition is passing off, various tonics of quinine and iron are prescribed.



In case of chronic inflammation of the liver, the patient must be careful as to the mode of living. Overeating and the drinking of heavy wines and strong spirits must be abandoned. In fact, persons suffering from this complaint would do well to become total abstainers from alcohol, and to eat only the simplest foods. When the condition is attributable to malaria or dysentery, these conditions must in addition receive treatment. The drugs which have been specially advocated for this condition are chloride of ammonium and nitrohydrochloric acid.

During the attack the following prescription may be taken:

℞ Chloride of Ammonia .....two drams
Dilute Nitrohydrochloric Acid ...two fluid drams
Distilled water .....three fluid ounces
These will mix and give clear liquid.
Dose: One teaspoonful one hour after each meal.

The following tonic should be taken during convalescence:

℞ Elixir Iron, Quinine, and Strychnine .....four fluid ounces.
Dose: One teaspoonful in a little water, half an hour before meals.

A good purgative is:

℞ Calomel .....quarter-grain tablets
Dose: One tablet every fifteen minutes, until ten are taken by bedtime. Follow in the morning with a bottle of citrate of magnesia.

ABSCESS OF THE LIVER

Definition.—An acute inflammation of the cellular structure of the liver, resulting in the formation of one or more abscesses.

Causes.—When an abscess develops in the liver, it is usually a manifestation of dysentery, appearing sometimes late in the disease, even after the diarrhea is cured; it may also follow upon inflammation of the liver due to other causes; and abscesses may form in this organ as in other sites in cases of blood-poisoning.

Symptoms.—The symptoms of abscess are much the same as in other types of inflammation, only they are more pronounced, and accompanied often by rigors, and by great enlargement of the liver. It is usual for the physician in a case of suspected abscess to make exploratory punctures in the liver with a hollow needle, when, if brown or reddish pus be found, the diagnosis is established.

Treatment.—The treatment of such an abscess consists in immediate opening, as soon as the diagnosis is made.

ATROPHY OF THE LIVER

Acute yellow atrophy is a destructive and fatal disease of the liver which is very rare, but which appears suddenly and apparently without cause. From the fact that a very similar state of the liver is produced by phosphorus poisoning, it is supposed that the condition is due to some poison of unknown nature circulating in the blood. Women are more often affected than men, and especially during pregnancy.

Symptoms.—It comes on with a slight degree of jaundice, which cannot be distinguished from simple jaundice, and lasts several days. Then the jaundice suddenly deepens, there is pain in the region of the liver, convulsions and delirium appear, the heart grows very weak, and death ensues in a day or two. If the liver be examined after death, it is found to be shrunken and soft, the cut surface is of mottled yellow and red color, the liver-cells being in places shriveled and degenerated, in other places completely broken down; crystals of leucine and tyrosine are found here and there; and the capsule and remaining liver-cells are stained with bile. The destruction of the liver as a secreting organ is complete, and recovery probably never occurs.

Treatment.—Relief can be afforded by taking a soft, fluid diet; no meats are to be eaten. Care of the bowels and rest in bed add to the comfort of the patient. Gastric sedatives may also be used with great benefit.

CANCER OF THE LIVER

Cancer of the liver is not uncommon, although it is rare for the disease to begin in the liver, the involvement of this organ being usually secondary to disease situated somewhere in the stomach or bowels.

Causes.—Cancer originating in the liver is very rare in earlier life, and most of the cases arise in old people in connection with the gall-bladder, and some appear to be produced by long-continued irritation of a gall-stone.

Symptoms.—The symptoms are largely those of cancer in general. There is great emaciation, which increases as the disease progresses. The liver is much enlarged, and its margin and sur-

face are rough, being studded with hard cancer masses of varying size, which can often be readily felt through the abdominal wall. Pain may or may not be present, amounting merely to a feeling of tightness, or being of a gnawing, aching, or burning character. Jaundice is a very common symptom, due to pressure of the cancerous masses upon the bile-ducts, and when it has appeared owing to this cause, it does not again disappear. When due to this cause, it is apt to be deeper in hue than any other form of jaundice, and is sometimes called "black jaundice." Dropsy in the abdomen arises in a similar way in consequence of pressure on the portal vein. Various disorders of digestion are present, among which are loss of appetite, nausea, vomiting, and constipation, or, in the later stages, diarrhea.

Treatment.—Where dropsy is present, the person must not be given any fluids; the diet should consist of solid material. It is also important to keep the kidneys working. This may be accomplished by taking the concentrated juice of lemons.

CIRRHOSIS—GIN-DRINKER'S LIVER—CONTRACTION OF THE LIVER

Definition.—Cirrhosis is a diseased condition of various internal organs, in which the proper tissue is replaced by fibrous tissue similar to scar-tissue. The name "cirrhosis" was originally given by Laennec to the disease as occurring in the liver, because of its yellow color, but it is now applied to a similar condition in the lung, kidney, stomach, etc.

Causes.—Cirrhosis of the liver is most commonly due to the abuse of alcoholic liquors, more particularly of ardent spirits; it also follows the use of other irritating articles of diet, and is frequently produced by malaria and by syphilis. In many cases, however, the cause is obscure.

Symptoms.—In one form of cirrhosis the liver is much contracted, its blood-vessels are pressed upon, and dropsy results. In another form there is great enlargement of the organ, and jaundice appears.

Treatment.—Nothing can be done to repair a cirrhosed organ, but the cause, if known, must be removed and further advance of the process prevented. In the case of the liver an occasional

dose of blue pill or calomel, followed by a saline purge, relieves the tendency to dropsy or jaundice. The calomel and salts are taken for two successive days; then there is an intermission of two days and the same treatment repeated.

The following prescription has been found to be valuable in cirrhosis of the liver:

℞ Basham's Mixture .....eight fluid ounces
Dose: One tablespoonful in a wineglass of water, three times a day, half an hour after meals.

Diet.—In the treatment of this condition the diet plays an important part. A light, farinaceous diet, warm clothing, and careful hygiene will be found valuable aids. Rest in bed, with complete relaxation, will relieve the swelling of the organs.

CONGESTION OF THE LIVER

Definition.—Congestion of the liver is a term sometimes applied to the slighter forms of inflammation, in which the liver is said to be actively congested. But the term is generally reserved for a state of passive congestion, quite distinct from any inflammatory process, which frequently affects the liver to a marked extent in persons who are the subject of heart disease and some forms of lung disease.

Causes.—It arises in consequence of the close connection of the liver with the right side of the heart, through the inferior vena cava and the wide hepatic veins, which open into this vessel just before its entrance to the heart. When the right side of the heart is dilated, or there is some obstruction to the circulation through the lungs, or some valvular disease of the heart, the blood is pressed back upon the liver, and thus congestion results.

Symptoms.—The liver becomes enlarged and causes a sense not so much of pain as of fullness and discomfort in the abdomen, which may be tender to the touch. The complexion is yellowish, the tongue furred, the appetite lost, and there are often both vomiting of bile and looseness of the bowels. There may also be headache, languor, and depression of spirits. At the same

time the lung or heart condition, which is responsible for the liver-congestion, gives rise to symptoms of its own.

Treatment.—The condition is usually a very chronic one, with exacerbations from time to time. It is treated, in the first place, by alleviating so far as possible the cause producing it. An occasional dose of calomel or blue pill, combined with some of the drugs like podophylline or euonymine, which increase the flow of bile, will relieve the condition for a time. Chloride of ammonium, iodide of potassium, and nitrohydrochloric acid are other drugs whose use is often advocated.

℞ Aloine, Belladonna, and Strychnine Pills ..... twenty-five pills

DIRECTIONS: Two of these pills are taken each night for three successive nights. If the effect is found to be too strong after the first dose, then take only one pill the following night.

℞ Blue Pill .....five grains

DOSE: Take one at night, following in the morning with a dose of Epsom salts. Repeat in three days.

FATTY DISEASE OF THE LIVER

Definition.—Fatty disease of the liver may consist of an infiltration of the cells of the liver with fat in those who eat to excess, particularly of rich, fat, or oily foods; or in wasting diseases there may be a degeneration in the liver-cells of this character.

Symptoms.—The liver is enlarged, and, though usually painless, it gives rise to discomfort and to embarrassment of breathing, particularly after meals. When due to overeating, other organs and the body generally are also loaded with fat. Indigestion and constipation are often present, and a person affected in this way can offer but feeble resisting power to any disease by which he may be attacked.

Treatment.—The treatment for fatty disease of the liver depends chiefly on the treatment for the symptoms which cause this condition, and which may occur from suppuration, tubercu-

losis, rickets in children, and syphilitic processes. The patient should have a light diet of toast and boiled milk for a period of two weeks. In addition, the following prescription is recommended to be taken:

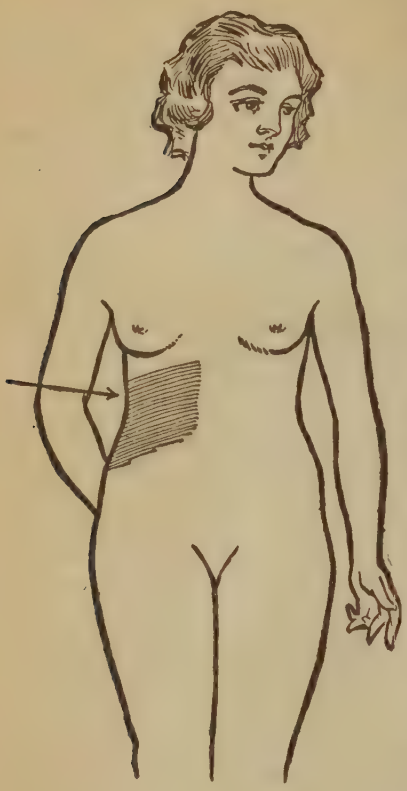
℞ Tincture Iron Chloride .....one fluid ounce
Dose: Ten drops in half a glass of water, shortly after eating.

CATARRH OF THE GALL-BLADDER

Catarrh may occur in the bile-passages as in other cavities lined by mucous membrane. It may either arise in the bile-ducts themselves, or may follow upon a catarrhal condition in the bowels, spreading up from the point where the common bile-duct opens into the small intestine. In the latter case the attack is an acute one, resulting from some indiscretion of diet, such as an unusually heavy and rich dinner, or following a chill. The form which begins in the small ducts in the liver, and spreads downward, is usually chronic, and the course of the trouble is somewhat as follows. It arises particularly in persons who lead an indolent or sedentary life, and who eat too much for the small amount of exercise they take. The condition is therefore commoner in the wealthy, and four times more frequent in women than in men. It is also very often found in the insane, who take little exercise. Since the bile is expelled from the liver largely by the movements of breathing, any cause like tight-lacing, which impedes this, causes stagnation of the bile, and favors catarrh. Pigments are deposited from the bile in the finer vessels, producing bile-sand, and thick, stringy mucus collects in these passages and in the gall-bladder, the irritation caused by these deposits still further aggravating the catarrh. Finally, this bile-sand may collect into small masses in the larger ducts or gall-bladder, and chemical changes in the mucus taking place, a crystalline substance called cholesterine encrusts them in a gradually thickening layer, so that finally large gall-stones may be produced.

Symptoms.—An acute attack of catarrh causes, in general, pain and tenderness to touch beneath the margin of the ribs on the right side, i.e., over the edge of the liver and the gall-bladder

as shown by the shaded area in the accompanying figure. There is also jaundice after a day or two. In chronic catarrh there is general ill health and indigestion, associated with a dark, sallow skin, and occasional attacks of biliousness. There is often, too, a vague, uneasy feeling in the region mentioned above, and in advanced cases there may be recurring attacks of gall-stone colic.



Treatment.—The treatment of acute catarrh is the same as for jaundice. The chronic form, though not of itself a severe ailment, should be treated because of its liability to produce gall-stones and because it impairs the general health. A simpler life, with not more than three meals daily, the avoidance of alcoholic beverages and highly spiced food, and the taking of more exercise, are the main requisites. Horseback exercise is specially to be recommended, and regular breathing-exercises night and morning are also good. To cleanse the bile-passages, large quantities of water should be taken with meals, and one or two glasses of warm water, in which is dissolved a lithia tablet, an hour before each meal, are specially beneficial. An occasional visit to Hot Springs or similar resorts is advantageous for this purpose. The bowels must be carefully regulated, and great temporary benefit is derived from the occasional use of a powerful cholagogue purgative.

Suppuration is a rarer but much more serious condition, which occasionally comes on in the course of a chronic catarrh. It may also arise as the result of an infective fever like typhoid, and sometimes results from the irritation of an increasing gall-stone. Its symptoms are an exaggeration of those of catarrh, along with shivering, high fever, and often delirium. The treatment necessary is an operation to drain the gall-bladder of its suppurating

contents, after which recovery often ensues, though the prospects are very serious.

JAUNDICE

Definition.—Jaundice is a yellow discoloration of the skin due to the deposition of bile pigment in its deeper layers. The condition is really a symptom only of some obstruction to the normal excretion of bile from the liver; but, both owing to the fact that the appearance presented by a jaundiced person is so striking, and because this symptom occurs more or less constantly along with a group of others, jaundice is in the popular mind elevated to the position of a disease by itself.

Causes.—As stated above, when the bile cannot escape into the intestine in the usual way, it is absorbed by the blood and lymph vessels, and some of its constituents are deposited in the various tissues throughout the body. Some obstruction to the outflow of bile is, therefore, a necessary condition, and this obstruction may either exist in the bile-ducts, which convey the bile from liver to intestine, or it may be caused by some disorganization in the liver which prevents the bile, formed by the liver-cells, from finding its way to the bile-ducts at all. The tint of the jaundice has no relation to the severity of the cause. Among those cases of jaundice due to obstruction of the larger bile-ducts, some are due to swelling of the mucous membrane lining the bile-duct or of that lining the small intestine at the point where the bile-duct enters it (catarrhal jaundice). This may arise as the result of a chill or of eating some irritating and indigestible food, and, though the resulting jaundice may last for several weeks, it forms a trifling malady. Obstruction may be due to gall-stones, and the resulting jaundice is then a symptom of this condition. Obstruction may be due to some cause quite outside the liver and bile-ducts, for example, the pregnant uterus, or enlarged glands lying near the liver, or a tumor in some adjacent organ may press upon the duct, the seriousness of the jaundice depending then merely upon the seriousness of the disease responsible for the pressure. In elderly persons who are likely to be the subject of cancer, long-continued jaundice is for this very reason a serious symptom. Cirrhosis of the liver, in which the small branches of the bile-duct become compressed

by the formation of fibrous tissue, may also be a cause of chronic jaundice.

Among the causes which disorganize the liver, one finds many poisons which are carried to it in the blood, for example phosphorus, mercury, chloroform, and snake poison. Certain infective diseases are also prone to produce this effect, of which may be mentioned yellow fever, malaria, typhoid fever, and pyemia. These conditions cause such changes in the liver that the bile, secreted by its cells, is unable to escape from the organ save by reabsorption into the blood.

Symptoms.—Yellowness, appearing first in the whites of the eyes and later over the whole skin, is the symptom that attracts notice. This tint varies from a pale sulphur-yellow through all gradations to a deep olive or bronze color, according to the completeness of the obstruction and the length of time the jaundice has lasted. The urine passed during the time the jaundice lasts is of a dark greenish-brown color, owing to the excretion of bile by the kidneys. Various digestive disturbances are present, the tongue is furred, the appetite poor, and a feeling of sickness is often felt, and is aggravated by eating fats. The stools are of a gray or white color, owing to the want of bile in the intestine, and for the same reason constipation, relieved occasionally by diarrhea, is present, and the stools have an excessively offensive smell. A bitter taste in the mouth is generally felt by the jaundiced person, due, as it is supposed, to the presence in the saliva of salts of the bile-acids, and the same or other substances in the sweat lead to occasional itching of the skin. It is commonly supposed that the fact that "all seems yellow to the jaundiced eye" is a constant symptom of jaundice, but yellow vision is really the exception rather than the rule. Slowness of the pulse, and, in long-continued cases, mental confusion and dullness, are other less evident accompaniments of jaundice.

Treatment.—The physician attempts, in the first place, to find out the cause of the obstruction to the outflow of bile. In old persons, particularly, this is occasionally a difficult matter, requiring long-continued observation of the patient. An X-ray examination would show if the obstruction was due to gallstones. The activity of the liver must be checked, as far as possible, and to this end rest in bed and the avoidance of all heavy and highly spiced food is necessary. The bowels must be regulated by saline purgatives, of which phosphate of soda is

one of the best, taken in teaspoonful doses in hot milk or water at night or after meals. In simple cases of jaundice, when the returning yellow color of the stools and disappearance of bile from the urine show that the bile-flow is becoming reëstablished, various substances, such as blue pill, euonymine, and rhubarb, which act as purgatives and as cholagogues, are given to quicken the expulsion of bile from the system. The affected person must exercise patience in waiting for the disappearance of the yellow color from the skin, for in marked cases it generally lasts for several weeks.

In serious cases, where the jaundice is due to cancer, disorganization of the liver by poison, etc., the treatment of the jaundice sinks into insignificance beside the treatment of the disease producing it.

The following capsules can be obtained from the druggist:

℞ Calomel .....one grain
Powdered Squill .....one grain
Dose: One capsule half an hour after each meal.
It will be necessary to take about two dozen capsules.

Or:

℞ Gray Powder .....four grains
Divide into twelve powders.
Dose: One powder after each meal and at bedtime.
When all are taken, take a Seidlitz powder.

The following is also recommended:

℞ Dilute Nitromuriatic Acid .....one fluid ounce
Dose: Fifteen drops in half a wineglassful of water, three times a day.

GALL-STONES

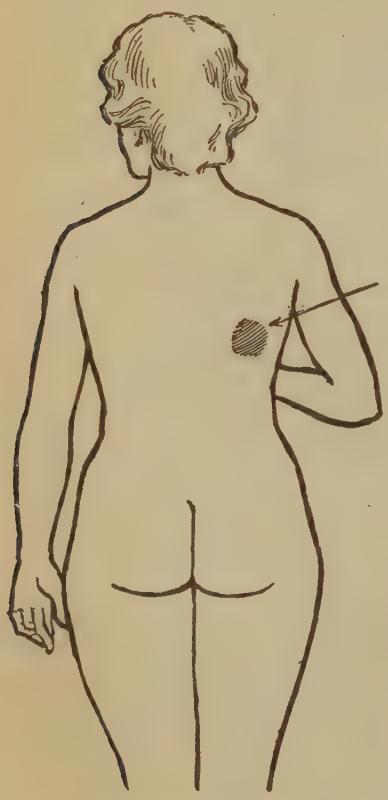
The smaller stones consist of a combination of bile-pigment with lime (bilirubin-calcium), and are deep brown in color; the larger ones have a core of this surrounded by cholesterine, and are lighter or even white in color. The size varies from that of small gravel, in which case several hundred stones may be present, to the size of a goose egg, when the stone is single. When there are several stones, they are faceted so as to fit against one another.

Symptoms.—To begin with, they can be easily demonstrated by means of the X-ray, and there are the same symptoms as in catarrh of the gall-bladder, which causes the formation of the

stones. Apart from these, stones may lie for years in the gall-bladder and give no trouble, but as a rule they produce marked symptoms in one of three ways:

(1) The mere presence of stones in the gall-bladder may give rise to much irritation, and the tenderness and pain over the region of the gall-bladder then become very marked. When bacteria find an entrance from the bowel, high temperature, shiverings, and sweatings develop, and suppuration may come on.

(2) The usual way in which gall-stones show their presence is by passing out of the gall-bladder along with the bile. If the stone be small, it reaches the bowel and is voided, without attracting attention beyond perhaps passing discomfort, after a meal, in the upper part of the abdomen. If the stone be large enough to stick in the cystic or common bile-duct, and particularly if it be angular, it sets up great spasm of the muscle fibers in the wall of the duct, causing the most agonizing pain. This "gall-stone colic" is felt on the right side as indicated by the shaded area in the accompanying figure. It comes on, as a rule, very quickly, and is accompanied by collapse, cold sweat, and vomiting. It lasts usually several hours, and often ceases quite suddenly, as the stone passes into the bowel or back to the gall-bladder. Next day there is usually some jaundice, which may last for a week or two. To discover if such an attack has really been due to a stone, it is important, for the next two days, to strain all the evacuations of the bowels very carefully through a fine sieve or through muslin.

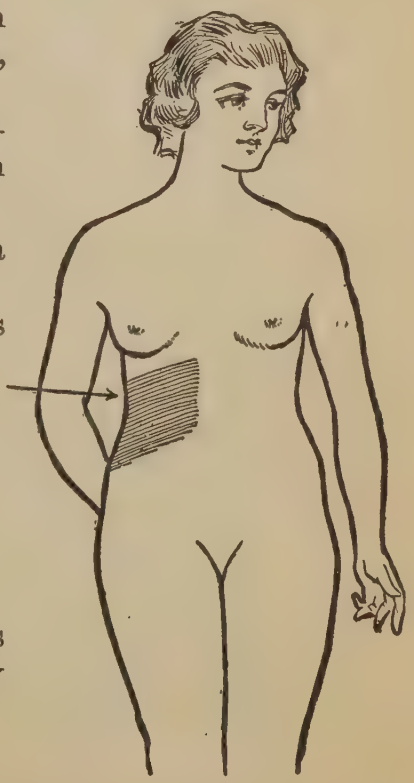


(3) Sometimes the stone remains jammed or impacted in one of the ducts, passing neither up nor down. In this case, the pain passes slowly off as the muscle fibers of the ducts become tired out, only to return again and again, till, in a milder degree, it

becomes almost constant. Gradually increasing jaundice comes on till the skin becomes even a dark olive brown. At the same time loss of weight and strength, and often dropsy, progress so far that the case may be very difficult to diagnose from cancer. In this case, too, suppuration may come on.

Treatment.—To prevent gall-stones, what has been said as to catarrh holds good, and if the accompanying catarrh be cured, even after large gall-stones have been formed, they may be comparatively harmless. Many substances which will dissolve gall-stones outside the body have been recommended in the hope that, taken into the system for long periods, they may gradually dissolve the stones in the gall-bladder. Such, for example, are ether, turpentine, and olive-oil.

When an attack of gall-stone colic occurs, hot turpentine fomentations should be at once applied over the area as shown in the accompanying figure. A hot bath, into which the whole body can be put, gives, after a little time, great relief.



During the acute stage of the attack the following prescription should be given:

℞ Tincture of Belladonna
one tablespoonful
Tincture of Hyoscyamus
two tablespoonfuls
Simple Elixir
three ounces
Mix.
Dose: One teaspoonful every two hours until pain is relieved.

The following prescription is recommended to prevent the early formation of stones:

℞ Capsules of Bile Salts
two grains each
Dose: One capsule three times a day, after meals.
At least one month's treatment should be taken.

With many cases of gall-stones there is marked gastric distress. Relief will often be obtained from the use of the following prescription:

℞ Dilute Muriatic Acid .....one tablespoonful
Essence of Pepsine .....three ounces
Mix.
Dose: One teaspoonful in a wineglass of water three times a day, after meals.

DISEASES OF THE KIDNEYS AND BLADDER

THE URINARY ORGANS

THE urinary organs form the system by which the urine is extracted from the blood, stored up, and at certain intervals discharged from the body.

They comprise the two kidneys, placed in the loins, the bladder, two ureters, leading from the kidneys to the bladder, which is situated in the front of the pelvis, and the urethra, which leads from the bladder out beneath the pubic bones to the exterior.

ANATOMY OF THE KIDNEYS

The kidneys are a pair of glands situated close to the spine in the upper part of the abdomen. They are on a level with the last dorsal and upper two lumbar vertebræ, and each is, to a great extent, covered by the twelfth rib of its own side. They are kept in this position by a quantity of fat and loose connective tissue, in which they are embedded, by the large vessels which supply them with blood, by the peritoneal membrane stretched over their front surface, and mainly perhaps by the pressure of the other abdominal organs against them.

Structure.—In size each is about 4 inches long, 2½ inches wide, 1½ inches thick, and weighs over 4 ounces. The size, however, varies a good deal with the development, and probably with the habits, of the individual. The left kidney is slightly longer and narrower and lies a trifle higher in the abdomen than the right.

The kidney in adult human beings presents a smooth exterior, though in early life, as in many animals, it is divided up into distinct lobes, corresponding to the pyramids found in the in-

terior. Enveloping it is a tough fibrous coat, which, in the healthy state, is bound to the kidney only by loose fibrous tissues and by a few blood-vessels that pass between it and the kidney. This capsule, which does not permit of much enlargement of the kidney, is an important factor with which to reckon when the kidney becomes congested in Bright's disease. The outer margin of the kidney is convex, the inner is concave, presenting a deep depression, known as the hilum, where the vessels enter its substance. At the hilum, the renal vein lies in front of the renal artery, the former joining the inferior vena cava, and the latter springing from the aorta almost at a right angle. Here, too, the ureter, which conveys urine down to the bladder, is attached. The ureter is spread out into an expanded, funnel-like end, known as the pelvis, to which the capsule of the kidney is firmly attached, and which further divides into little funnels known as the calices. On splitting open a kidney, one finds it to consist of two distinct parts: a layer on the surface, about ⅛ inch thick, known as the "cortex," and a part toward the hilum known as the medulla. The latter consists of pyramids, arranged side by side, with their base on the cortex and their apex projecting into the calices of the ureter. The apex of each pyramid, of which there are about twelve in all, is studded with minute holes, which are the openings of the microscopic uriniferous tubes.

Each pyramid is in effect, taken together with the portion of cortex lying along its base, an independent little kidney. About a score of small tubes open on the surface of each pyramid, and these, if traced up into its substance, divide again and again so as to form bundles of tubes, known as medullary rays, passing up toward the cortex. If one of these be traced still farther back, it is found, after a very tortuous course, to end in a small rounded body, the Malpighian corpuscle, or glomerulus.

If the blood-vessels now be traced through the kidney their course is found to be as follows: The renal artery splits up into branches, which form arches at the line of junction of cortex and medulla, and from these again spring vessels that run up through the cortex, giving off small branches in every direction. Each of these last ends in a little tuft of capillaries inclosed in a capsule that forms the end of the uriniferous tube above described, and capillaries with capsule are known as a glomerulus.

The blood, after circulating in the glomerulus, emerges by a small vein, which again splits up into capillaries on the walls of the uriniferous tubes. From these it is collected finally into the renal veins and by them leaves the kidney. By means of the double circulation, first through the glomerulus and then around the tube, it comes to pass that a large amount of fluid is removed from the blood in the glomerulus, and then the concentrated blood passes on to the uriniferous tube for removal of part of its solid contents. Other straight arteries come off from the arches above mentioned and supply the medulla direct, the blood from these passing through another set of capillaries and also finally into the renal veins. Though the circulation just described is confined entirely to the kidney, it has certain small connections both by arteries and veins which pass through the capsule and join the lumbar vessels communicating direct with the aorta. These connections are of importance in kidney disease, because through them the kidney circulation can be relieved by applications to the loins.

Function.—The chief function of the kidneys is to separate urine from the blood. In this process, solids are excreted, which have been produced by the liver, or by the activity of various tissues, from the used-up material of the body. To keep these in solution a large amount of water is also excreted, and these two processes are, to a large extent, carried out by different parts of the kidney. The watery part of the urine, as already mentioned, passes, through the walls of the capillaries forming the glomerulus, into the interior of Bowman's capsule, by a process which may roughly be described as filtration, the cells forming the capillary walls exercising a selective action and allowing water to pass through, though in health they keep back the albumin and other important constituents of the blood. It has been shown by Nussbaum, from experiments upon the kidney of the newt, which has separate blood-vessels for the glomeruli and for the tubules, that various salts and peptone are also extracted from the blood by the glomeruli. The fluid passed into Bowman's capsule runs from it down the much convoluted uriniferous tubule. The tubule, on the other hand, upon whose walls run capillaries containing highly concentrated blood, excretes the urea, uric acid, and other solids of the urine, and these solids are washed out and down into the ureter by the water

passing down the tubule from the glomerulus. That solids are excreted by the cells lining these tubules has been proved by Heidenhain, who experimented by injecting indigo into the blood-vessels of animals, and finding after death that these cells and the interior of the tubules contained quantities of the blue pigment.

When the kidneys fail to act, these solid waste substances accumulate in the blood, producing a condition of poisoning known as uremia, which, if not speedily relieved, soon causes death. The condition receives its name from urea, which is the chief waste substance excreted by the kidneys, though, in all probability, it is not the one mainly responsible for the poisoning.

DISEASES OF THE KIDNEYS

The kidneys, being deeply buried in the abdomen, give little direct sign even when seriously diseased, though many of the effects upon the general constitution are sufficiently marked and serious.

General Symptoms.—The following are some of the general symptoms common to various types of kidney disease:

Pain, of an aching nature, situated high up in the loins is occasionally a symptom of inflammation of the kidneys, but pain in the lower part of the back is found in so many other diseases, and is so generally absent in serious kidney affections, that it is of little importance as a symptom. When a stone lodges in the ureter, however, there is a very definite type of pain known as renal colic. This pain is of an agonizing nature, shoots down from the kidney region to the groin, and usually comes on with great suddenness. Also, when a kidney becomes movable and approaches the front of the abdomen, direct pressure upon it causes a sickening sensation of a peculiar type, quite different from ordinary tenderness.

Wasting and general ill health is a prominent symptom of diseases which cause much destruction of the substance of the kidney, and sometimes a state of bad health, which has lasted for long, is found to be attributable to chronic and advanced kidney disease, which has given no sign till careful examination reveals its presence. The digestive and other internal organs are impaired also, and give rise to various complaints, while the

resisting power of the body to disease becomes so much lowered that the victims of kidney disease fall a much readier prey to infectious maladies than do healthy people.

The URINE almost invariably shows changes in kidney diseases. In acute conditions it is diminished, generally contains albumin, and may be bloody. When unusual material is present in the kidney, careful examination of the urine generally discovers traces of it in this excretion; for example, pus in the urine points to a suppurative condition situated somewhere in the urinary tract; and when a stone is present in the kidney, its nature may often be conjectured by an examination of the crystalline deposit in the urine. In chronic Bright's disease, the urine is generally increased in amount, pale, and, as a rule, contains greater or less amounts of albumin.

DROPSY, though due to many other conditions than Bright's disease, is a most important symptom of this and other kidney troubles. When dependent upon some defect in the kidneys, it appears most generally in the morning after sleep, and affects the loose tissues of the body, like the skin beneath the eyes, and that on the back of the hands, which become swollen and puffy.

CHANGES IN THE CIRCULATION take place in chronic kidney disease. The signs of thickening in the arteries and in the heart-wall afford to the physician one of the most important signs both of the presence and of the severity of Bright's disease. These changes produce pain in the chest, loss of mental power, bloodlessness, impairment of vision, and often lead to apoplexy.

UREMIA is a condition which is present in all cases where the function of the kidneys is seriously impaired. It is a general poisoning of the system by waste products which the kidneys have failed to excrete, and may be acute or chronic in type. The condition most commonly comes on in chronic Bright's disease, less commonly in the acute forms, but may also occur in other diseases of the kidney, such as tubercular disease, waxy degeneration, and stone in the kidney.

The most important class of diseases affecting the kidneys is that comprising the changes grouped together as Bright's disease, in which albumin is excreted in the urine and dropsy is very often present. Some of the other important affections of the kidney will be fully described in the following pages.

ACUTE NEPHRITIS—BRIGHT'S DISEASE

Definition.—Bright's disease is a term in medicine applied to a class of diseases of the kidneys which have as their most prominent symptom the presence of albumin in the urine, and frequently also the coexistence of dropsy. These associated symptoms, in connection with kidney disease, were first described in 1827 by Dr. Richard Bright. Since that period, the subject has been investigated by many able physicians, and it is now well established that the symptoms above named, instead of being, as was formerly supposed, the result of one form of disease of the kidneys, may be dependent on various causes.

The terms nephritis and inflammation of the kidneys are applied to the same condition. It is usual to subdivide Bright's disease or nephritis into three types:

(*a*) Acute Bright's Disease,
(*b*) Subacute Bright's Disease, and
(*c*) Chronic Bright's Disease.

(*a*) **Acute Bright's Disease** (*acute desquamative nephritis*).

Causes.—An acute attack commonly arises from exposure to cold, from taking certain acute poisons like phosphorus, corrosive sublimate, etc., or as a complication of some acute diseases, such as erysipelas, diphtheria, and especially scarlet fever, of which it is one of the most frequent and serious consequences. In this form of the disease the kidneys become congested, their blood-vessels being engorged with blood, while the tubules, or the glomeruli, are distended and obstructed by accumulated epithelium, as also by effused blood and the products of inflammation, all which are shed off and appear in the urine.

Symptoms.—The symptoms to which the condition gives rise are usually of a severe character. Pain in the back, vomiting, and slight febrile disturbance commonly usher in the attack. Dropsy, varying in degree from slight puffiness of the face to an accumulation of fluid sufficient to distend the whole body, and to occasion serious embarrassment to respiration, is a very common accompaniment. The urine is reduced in quantity, is of dark, smoky, or bloody color, and exhibits to chemical reaction the presence of a large amount of albumin.

This state of acute inflammation may by its severity destroy

life, the excretion of urine becoming stopped, so that waste products accumulate in the blood and paralyze vital activity. Death is then generally preceded by headache, convulsions, and unconsciousness, the condition known as acute uremia, though, even in extreme cases, energetic treatment may save the patient's life. Death may also result from the interference of excessive dropsy with the action of the heart and lungs. Again, the acute disease may partially subside and result in the establishment of subacute or chronic Bright's disease. On the other hand, an arrest of the inflammatory action frequently occurs, and this is marked by the increased amount of the urine, and the gradual disappearance of its albumin and other abnormal constituents, as also by the subsidence of the dropsy and the rapid recovery of strength.

Treatment.—The greatest care must be taken of a person showing, for the first time, the symptoms of acute Bright's disease, because, although the condition is seldom fatal in a first attack, if it be allowed to pass on to the chronic form, the person must in future live the life of a semi-invalid. The patient must remain in the equable temperature of bed, carefully protected from all chance of chill, and is usually placed between blankets. The diet is of the blandest type possible, being generally confined to milk or thin gruel with cream, and large quantities of water, which have the effect of washing out the effete materials and inflammatory products deposited in the kidneys. Various alkaline drinks, such as lemonade, citrate or bicarbonate of potassium in water, or whey, are given for the same reason. Local means of relieving congestion of the kidneys, such as warm fomentations upon, or cupping of, the loins, are sometimes adopted. It is essential to maintain free action of the skin, and to this end, in addition to confinement in a warm bed, wet packs, hot-air baths, and various drugs which produce perspiration, are administered, particularly if the onset of uremia threatens.

Free movement of the bowels is important; some authorities state that an attack of acute Bright's disease may sometimes be cut short at its commencement by administration of a saline purge.

Various drugs which increase the flow of urine have been recommended. Of these digitalis and strophanthus are least subject to objection; while caffeine, diuretin, and other diuretic drugs are apt to irritate the kidneys and delay recovery.

When dropsy is a troublesome feature the abolition of salt from the diet and the substitution of salt-free bread and potatoes, fresh butter, fruit, eggs, and green vegetables for milk is recommended by some authorities.

During the period of convalescence from this disease especial care must be exercised in the avoidance of animal food in large quantity, stimulants, and chills to the surface of the body. A change to a dry, warm climate is often beneficial.

A useful formula is:

℞ Potassium Acetate ..... two fluid drams
Infusion of Digitalis ..... three fluid ounces
Mix.
Directions: A tablespoonful well diluted with water, three times a day.

After the acute symptoms have subsided, the following formula will be found useful:

℞ Basham's Mixture ..... four fluid ounces
Directions: Two teaspoonfuls in water, three times a day.

(*b*) **Subacute Bright's Disease** is the name applied to that type of the disease in which the acute form is passing off with unusual slowness or in which the whole kidney is so much damaged that recovery is impossible, and the patient is in transition from the acute to the chronic form. The kidney is large and white; the cells of its tubules break down and undergo fatty degeneration and are subsequently discharged in the urine as fatty and granular casts.

Symptoms.—The patient in this stage becomes pale, bloodless, prone to dropsy, has much albuminuria, and is often greatly reduced in flesh and strength.

Treatment is similar to that for the acute form.

(*c*) **Chronic Bright's Disease** occurs in several forms.

The secreting tissue of the kidney may be greatly degenerated and the epithelial cells of the tubules changed in character (*chronic desquamative nephritis*), but the increase of fibrous tissue is particularly noticeable. The kidney may at first be large in size (*large white kidney*), but more often is smaller than usual, tough in consistence and rough on the surface, due to the abnormal development of connective tissue and relative atrophy

of the true kidney substance (*cirrhotic* or *granular contracted kidney*).

A special form of this type of Bright's disease is associated with extreme degeneration of the blood-vessels (*arteriosclerotic kidney*). In this the atrophy and formation of fibrous tissue are specially marked at certain points where arteries have become filled up, forming deep dimples in the kidney surface.

Still another form of chronic Bright's disease is the *waxy* or *amyloid kidney*, in which the organ is enlarged, and first its blood-vessels, later its connective tissues, become the seat of waxy disease. This condition is usually associated with similar disease in the liver and bowels, and caused by chronic ailment of a wasting character such as tuberculosis, syphilis, or suppurative bone disease; this disease is not now so frequent.

Symptoms.—Chronic nephritis may escape recognition in its early stages from the insidious way in which albuminuria, dropsy, and other symptoms begin; or it may follow on a marked case of acute and subacute type. Later on it is easily recognized. When the secreting tissue of the kidney is widely affected albumin with hyaline and granular casts are present in the urine. When the interstitial tissues are much affected—a condition often but not invariably associated with gout—general arterial disease is also present, and, accordingly, dimness of vision, due to dropsy of and hemorrhages into the retina, and also hypertrophy of the heart and degeneration of the arteries leading often to fatal apoplexy, are regular accompaniments of this form of the disease. There is also a great quantity of urine which is lacking in the usual solid constituents and may contain but little albumin and few tube casts.

Treatment.—The treatment of chronic Bright's disease, in its various forms, consists in leading a life carefully regulated in diet and habits, so as to throw as little strain as possible upon the damaged kidneys. In certain cases a milk diet proves beneficial, even curative. Generally speaking, a meat diet must be restricted, and permitted only so far as to make up the great drain upon the system caused by constant loss of albumin in the urine.

The patient is benefited by taking at intervals for a week or thereabout a diet composed only of rice, arrowroot, corn-starch, vegetables such as cabbage, cauliflower, carrot, turnip, onion, lettuce, rhubarb, spinach, tomato, sweet and acid fruits, sugar,

jams, and soft fats like butter, olive oil, and cream. These contain a minimum of nitrogenous food.

Various drugs have been tried with a view of curtailing the loss of albumin, but none have proved of much utility. The chronic desquamative nephritis is perhaps more benefited than any other disease by a change to a genial, warm, and dry climate in winter and spring. In the cirrhotic form of the disease various drugs, such as nitroglycerine and various nitrites, are employed to counteract the interference with the circulation and the tendency to apoplexy due to the diseased arteries.

This disease calls for the direct attention and supervision of a physician. The following formula is found useful:

℞ Potassium Acetate .....one-half ounce
Infusion of Digitalis .....six fluid ounces
Mix.
Dose: One tablespoonful in a glass of water, every six hours.

SUPPURATION OF THE KIDNEYS

Suppuration within the kidney either follows upon suppuration in the lower urinary passages, spreading upward from the bladder by way of the ureters, or infection may be carried by the blood-stream to the kidney from this or other regions. It is not of such frequent occurrence now as it was in the days before the use of antiseptics, when it went by the name of "surgical kidney," owing to the frequency with which this condition followed surgical operations. The symptoms are much the same as those of inflammation in the bladder with, in addition, pain in the loins, a hectic temperature, and shivering fits or "rigors."

Treatment.—The condition is very serious and is apt to end in death. Urotropine, ammonium benzoate, and other substances are administered internally with the view of purifying the urine. If the person be strong enough to stand the operation, an opening is made into the kidney through the loins, and the suppurating cavity either drained or the whole kidney removed.

The following formula is useful:

℞ Urotropine .....five-grain tablets
Dose: One tablet in half a glassful of water, every four hours thoroughly dissolved.

FLOATING KIDNEY

Floating kidney is a condition of very common occurrence, if one include under this designation cases in which the kidney is slightly movable; being found, it is said, in ten or twenty per cent. of all women, and less commonly in men. When the degree of movement is considerable, the condition is responsible, by its pressure upon neighboring organs, for many obscure abdominal complaints, from severe conditions like chronic obstruction of the bowels or constant pain, down to inveterate dyspepsia.

Treatment.—Palliative treatment is sufficient for most cases. A tight-fitting jersey or an abdominal belt may be sufficient to give relief in many cases, particularly in stout women. Tonics and massage or cold douches to the abdomen are also of great benefit. Sometimes the condition becomes so painful or so troublesome that an operation to cure it radically becomes advisable. The usual operation consists in exposing the kidney from behind, through the loin, stitching it into place, and supporting it till adhesions begin to form by packing the wound for a few days with iodoform gauze. In some cases the kidney is found dilated and destroyed—the condition known as hydronephrosis—in consequence of the ureter having been blocked, and in such a case the whole organ, being useless, is removed.

TUBERCULOSIS OF THE KIDNEY

Tuberculosis of the kidney also is frequently secondary to tubercular disease of the testicle or bladder, and the disease advances slowly, giving but little sign of its presence. It is treated by good food, rest, and fresh air. When it is evident from pus in the urine, a swelling in the abdomen, and other signs, that the kidney disease is advancing, excision of the kidney is the only operative measure which promises much success. Since, in a certain number of cases, both kidneys are diseased, the surgeon often examines the bladder by means of the cystoscope and passes a fine catheter along this instrument, up each ureter into the kidney. He thus draws off the urine from each kidney separately and can tell to what extent each is active, and whether he may safely remove one of them.

RENAL CALCULUS—STONE IN THE KIDNEY

Definition.—Renal calculus means that salts of the blood and urine have collected in the kidney and form a small granule, or they may be as large as a pea.

Symptoms.—Although stones may occur at all ages, they are certainly commoner after middle life. If the stone stays in the kidney, there is severe pain in the loins, cloudy urine with pus in it, and the person notices that he does not pass as much urine as previously. If the stone leaves the kidney and passes down to the bladder, it may be caught in the ureter. This gives very severe pain in the lower part of the abdomen, called Renal Colic, which lasts for a long time. This pain usually passes down the inner side of the leg of the side the stone is on. The patient has a high temperature and develops a cold sweat. If the stone passes on to the bladder, the pain is relieved; otherwise it may stay in the one position and stop the flow of urine from one kidney. In most cases it is necessary to have an X-ray picture taken to locate the stone.

Treatment.—As soon as the colic comes on, the person should have a hot tub bath, and warm water should be taken very freely. If the pain is not relieved, give the following prescription:

℞ Tincture of Belladonna ..... three teaspoonfuls
Peppermint-water ..... two ounces
Mix.
Dose: One teaspoonful in a wineglass of water, every three hours until pain is relieved.

HEMATURIA—BLOODY URINE

Definition.—Hematuria is a symptom of other diseases. It does not occur without some very prominent disease being present in the body. This condition may be located in the kidney or else be found in the liver or spleen, in which case an extra tax is put on the kidneys.

Causes.—It is most commonly found with blood diseases and in fevers. Stone in the bladder has also been the cause of blood in the urine. There are many other causes, but when this con-

dition is present a thorough physical examination should be made by a physician.

Symptoms.—The presence of blood in the urine will be noticed by the urine being red, smoky, or brownish in color. The examination should be confirmed by chemical tests, because it is a crude means of diagnosis, by color alone. When the blood comes out clotted, it means the trouble is in the bladder; if it appears in long strings, it usually means ulceration of the urethra.

Treatment.—As mentioned above, this condition is only a symptom, so that to treat it we must find the basic disease. In order to stop the hemorrhage, the following is to be given:

℞ Fluidextract of Ergot .....one ounce
Dose: One teaspoonful in a wineglass of cold water every three hours for four doses.

The patient usually becomes anemic from the loss of blood, in which case the following is to be given:

℞ Tincture of Iron Chloride .....one ounce
Dose: Half a teaspoonful in a glassful of water, three times a day.

HYDRONEPHROSIS

Hydronephrosis is a chronic disease in which the kidney becomes greatly distended with fluid. It is due to some blockage of the ureter connecting the kidney with the bladder. The two chief causes of this are the lodgment in the ureter of a stone formed in the kidney, and kinking of the ureter in consequence of a floating condition of the kidney. The symptoms it occasions are those due to pressure on surrounding organs, along with the appearance of a rounded swelling high up on one or other side of the abdomen. The treatment necessary is, generally, removal of the affected kidney, which, if the second kidney is sound, affords complete relief.

URINE

Urine is the excretion produced by the kidneys, and consists chiefly of waste substances resulting from the activity of the body, dissolved in water. The function of the kidneys consists almost entirely in selecting these substances from the blood; their actual formation takes place in the liver, muscles, etc.

The urine and the perspiration are to a great extent interdependent; thus, if the kidneys are acting vigorously, the skin becomes very dry, while if there has been much perspiration, as in fevers, the urine is small in amount and highly concentrated. The amount of water lost from the body daily by perspiration is in health about half the amount passed by the urine, and, though the sweat contains little of the waste material present in the urine, the glands of the skin can be made to take up the function of the kidneys to a great extent, when the latter organs are diseased. Most poisons taken into the body are excreted by way of the urine, for instance, morphia and strychnine, and so also are the germs of many diseases, as those of typhoid fever.

Composition.—About 96 per cent. of the urine is water, the remaining 4 per cent. being solids dissolved in it. Of the solids, far the most important is urea, the daily output of which is about 35 grams, or somewhat over 1 ounce. Common salt stands next in quantity, its amount being about half that of the urea. Phosphates and sulphates are also important constituents combined with potassium, sodium, calcium, and magnesium, while there is less than 1 gram each of creatinine, uric acid, and ammonia.

Pigments are also present in the urine and to them its color is due. These pigments, known as urobilin, urochrome, etc., are derived indirectly from the coloring matter of the blood, and are produced also by the liver.

Amount.—The amount of urine passed daily is about 50 ounces (1450 cubic centimeters), subject to the variations mentioned above. A child of course passes much less than an adult, and the general statement may be made that under the age of twelve years a child passes daily 2 ounces of urine for every year of its age, an infant of two years therefore passing 4 ounces of urine daily, while a child of five years passes 10 ounces daily.

The amount of urine is *increased* in some diseases, of which diabetes, chronic Bright's disease of the cirrhotic type, and hysterical conditions may be mentioned as the chief. In other conditions it is *diminished*, notably in acute Bright's disease, in fevers and feverish states generally, and in heart diseases.

Complete stoppage of the urine may occur for a time in the feverish conditions of children, or it may be due to acute Bright's disease, when the condition is a very serious one. When the

stoppage is due to failure of the kidneys to secrete any urine, the condition is known as *suppression.* When the stoppage is due to such a cause as blockage of the ureters by stones or of the urethra by a stricture, although secretion by the kidneys still goes on, it is known as *retention.* Stoppage of the urine, to whatever cause it be due, may often be relieved by placing the patient in a hot bath and administering to him sweet spirits of niter or other diaphoretic, a mode of treatment that is perfectly safe in the absence of a medical man.

Color.—The tint of normal urine is generally described as straw or amber colored, but it may be considerably changed by various diseases or drugs.

Pallor, giving the urine a watery appearance, is found in diabetes, and in chronic Bright's disease of cirrhotic type, also in persons who drink large quantities of water.

Orange or red color may appear when senna or rhubarb has been taken; when blood is present the color may be pink or bright red; urates cause a turbid red appearance.

Smoky tint, depriving the urine of transparency, is caused by small quantities of blood.

Green or greenish yellow urine is usually due to bile, or may be produced by taking santonine.

Black urine is most commonly due to absorption of carbolic acid from surgical dressings. It is often passed by those who are taking guaiacol or creosote, for instance, consumptives.

Odor.—Healthy urine has a faint aromatic odor, but when it begins to decompose an unpleasant ammoniacal smell is given off. Thus the presence of cystitis, or dribbling of the urine, is betrayed by the odor of the patient's personal or bed clothes. When turpentine and some other aromatic drugs have been taken, the urine acquires an odor of violets, and in diabetes it presents an aroma similar to that of new-mown hay.

Specific Gravity of urine varies in health from 1015 to 1025 (distilled water being 1000). A urine of lower specific gravity suggests the presence of chronic Bright's disease, while a higher specific gravity may be due to diabetes, or to a feverish state.

Reaction.—When the urine is tested with litmus paper, it is found to be distinctly acid in general, and this is of importance, because the acid has an antiseptic action. This acidity is due, not to free acids, but to acid salts such as acid phosphate of

sodium. In consequence of the secretion of acid from the blood into the gastric juice that is poured into the stomach shortly after meals, the urine may at such times become distinctly alkaline. In herbivorous animals and in vegetarians, owing to the great quantities of alkaline salts eaten in the diet, the urine is permanently alkaline.

Deposits.—In healthy urine there is usually a fleecy deposit of mucus secreted by the mucous membrane of the urinary passages. A pink or yellow deposit, that settles as soon as the urine begins to cool, and that often leaves a stain upon the utensil in which the urine has stood, is due simply to urates. Uric acid is a rare deposit, and, when present, falls in very scanty yellow or brownish grains. A white deposit that collects upon the bottom of the utensil after the urine has stood undisturbed for some time may be due to phosphates, to pus, or to débris from inflamed kidneys known as tube-casts.

Abnormal Substances.—Many unusual substances taken into or formed in the body are got rid of in the urine, sometimes just as they have entered the body, in other cases considerably changed, viz., drugs, and the poisons of various diseases. Further, various bacteria and parasites can be discovered in the urine in some diseases. Elaborate chemical or microscopical examination is necessary in order to reveal these, but there are five substances whose detection is of great importance, and which are discovered with comparative ease. These substances are (1) albumin; (2) blood; (3) grape-sugar; (4) pus and tube-casts; (5) bile.

(1) Albumin is present in various conditions mentioned under Albuminuria, and may be recognized by the following tests:

(a) *Boiling*, after the addition of a few drops of acid, produces a copious white cloud of coagulated albumin.

(b) *Heller's test.*—Place some strong nitric acid in the bottom of a test-tube, and carefully pour in urine above it. If the urine contains albumin, a dense white line forms where the two fluids meet.

(c) *Picric acid.*—Drop some strong solution of picric acid into a test-tube containing urine. If albumin is present each drop carries down a white cloud of coagulated albumin.

(2) Blood is present in acute Bright's disease, in congestion

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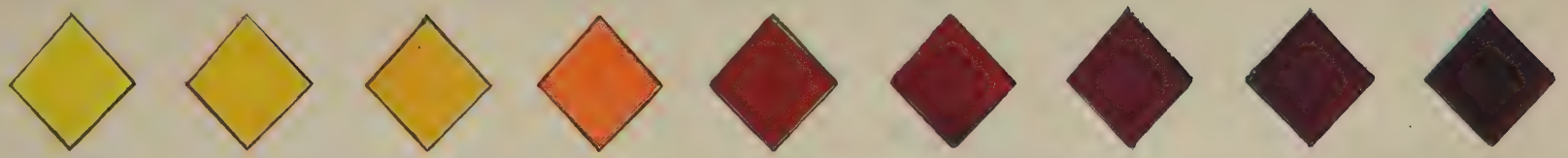
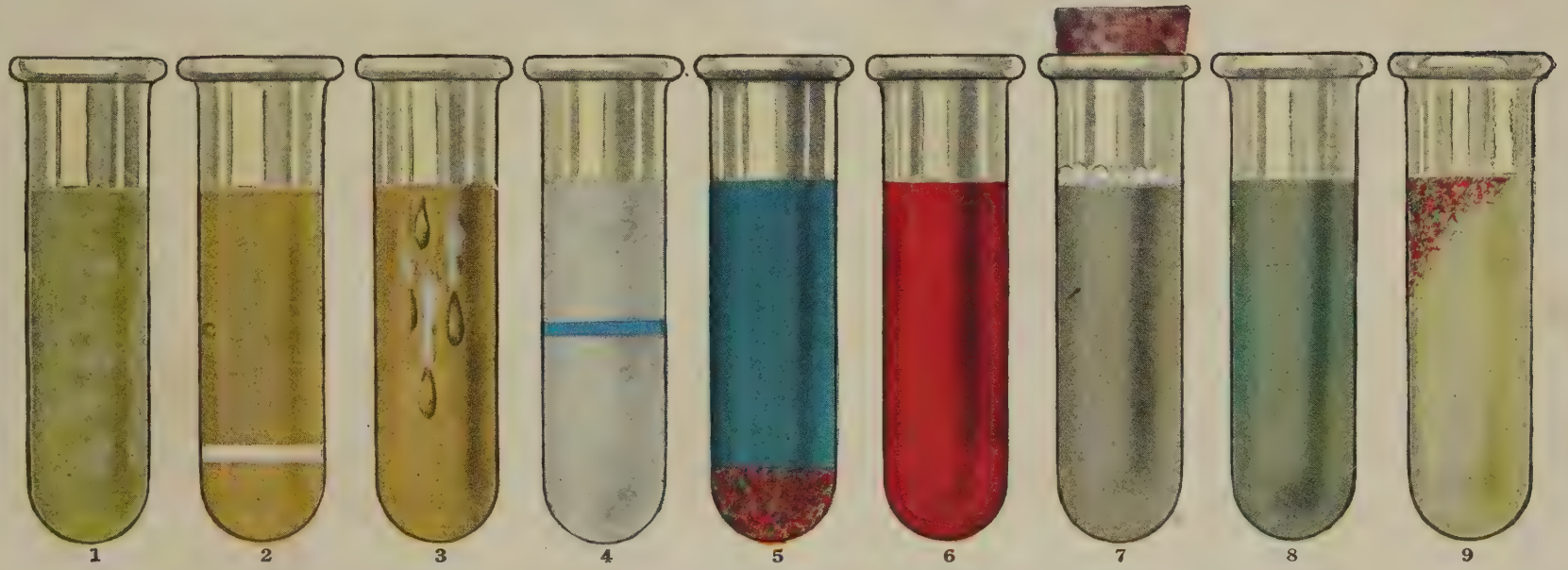
STANDARD SCALE OF URINARY COLORS



Normal (Concentrated Urine) (Hematuria — Bloody Urine) Severe Inflammation

SIMPLIFIED URINARY TESTS FOR VARIOUS DISEASES



THESE TESTS HAVE BEEN SELECTED AS THEY ARE THE BEST ADAPTED FOR HOME USE

1. Normal Urine.
2. Heller's test for albumin, page 808; see article on Albuminurea, page 812.
3. Picric acid test for albumin, page 808.
4. Test for blood, page 808; blood indicates Bright's disease, congestion of kidneys, stone, ulcer, or tumor in the urinary organs.
5. Fehling's test for grape-sugar, page 809; the continuous presence of grape-sugar is a symptom of Diabetes, see page 815.
6. Johnson's test for grape-sugar, page 809.
7. Fermentation test for grape-sugar, page 809.
8. Test for pus, page 809; the presence of pus indicates stone in the kidney, page 815; also stone in the bladder, page 823.
9. Test for bile, page 810; bile is a symptom of jaundice, liver trouble, etc., page 787.

of the kidneys, or when a stone, ulcer, or tumor is present in any of the urinary organs. If a drop or two of tincture of guaiac resin is mixed with a little of the suspected urine to form a white fluid in a test-tube, and some ozonic ether or oxidized turpentine is poured in above this mixture, a deep-blue color appears where the two fluids join, when blood is present. A similar result is given, however, by the urine of patients who have been taking iodide of potassium, so that for absolute certainty a drop of the urine must be examined under the microscope to find if blood-cells are actually present.

(3) GRAPE-SUGAR is a sign of diabetes when it is present constantly in the urine. It may also be found following upon a diet that contains a great deal of sugar—a harmless condition known as glycosuria.

(a) *Moore's test.*—Place some of the suspected urine in a test-tube, render it alkaline by adding liquor sodæ or liquor potassæ, and boil for some time. If sugar is present, a brown substance with pleasant odor (caramel) is produced.

(b) *Trommer's test.*—Fill a test-tube to a depth of 2 inches with urine, add ¼ inch of liquor potassæ and one or two drops of copper sulphate solution. A blue fluid is produced and must then be heated. If sugar is present, the blue cupric salt is reduced to red and yellow cuprous salts.

(c) *Fehling's test.*—A special blue-colored solution composed of copper sulphate, Rochelle salt, and caustic potash is placed in a test-tube and boiled. While it is hot, a few drops of suspected urine are added, and if sugar is present, red and yellow cuprous salts are formed.

(d) *Johnson's test.*—Pour the suspected urine, to a depth of 1 inch, into a test-tube, add ¼ inch of picric acid solution, and a few drops of liquor potassæ. Boil the mixture, and if sugar is present a deep port-wine color is produced.

(e) *Fermentation test* is the most reliable. A little yeast is shaken up with some of the urine, placed in a special glass which is closed at the upper end, and allowed to stand in a warm place over night. If the urine contains sugar it will ferment and bubbles of carbonic acid gas collect at the upper end of the glass.

(4) PUS AND TUBE-CASTS are the sign of inflammation or of ulceration somewhere in the urinary passages. Pus alone is generally a sign that the bladder is affected; tube-casts always

point to involvement of the kidneys. If tincture of guaiac resin is added to urine containing much pus, a greenish tinge is produced, or if liquor potassæ is added the urine becomes ropy. These, however, are unreliable tests, and for the detection of pus or tube-casts in small amounts a drop of urine must be placed on a glass slide and examined with the microscope.

(5) Bile in the urine is a sign that the bile-ducts are obstructed, and that bile is being absorbed into the blood. Sometimes the jaundice that accompanies this condition is so slight as to escape notice, so that the detection of bile in the urine is an important sign. Place some of the urine in a large conical glass, dilute it with water till quite transparent, and pour some impure nitric acid down the side of the glass. If bile is present in the urine, a brilliant play of colors—yellow, red, violet, and green—takes place where the urine and acid meet.

RETENTION OF URINE

Definition.—The term "retention" is applied to cases in which urine is duly secreted by the kidneys, but for some reason is retained in the bladder; while the more serious condition, in which the kidneys fail to produce urine, is known as "suppression." The latter condition is mentioned at Urine under the heading of Amount.

Causes.—The urine may be retained either because the bladder is too weak to expel it, or because of some obstruction to the passage by which it should be voided. Weakness is a rare condition, and is generally the result of some damage to the nervous system, this being one of the troublesome symptoms that follow an injury to the spinal cord; it is accompanied by dribbling away of the urine when the bladder becomes fully distended. A similar condition results from long-continued distension produced by some obstruction to the outflow.

Among the cases due to obstruction, some are acute and merely temporary, such as the difficulty of passing water that follows upon any operation near the bladder, viz., one for piles, or that is apt to follow childbirth. In these cases the difficulty commonly is due to spasm, and does not persist more than a day or two. Among the more chronic cases of retention perhaps the commonest are those caused by enlargement of the prostate

gland and consequent blockage of the outlet from the bladder; this condition is very common in old men. In these the retention comes on very gradually, and it is a common experience to find that the bladder never empties completely as it ought to do, but forms a sort of reservoir from which an overflow is discharged every few hours. The condition that leads to the most complete form of retention is a stricture or narrowing of the urethra due to the scar of previous injury or ulceration. Similar blockage results also, in rare instances, from the pressure of some tumor upon the urethra or the displacement of a neighboring organ.

Treatment.—Cases in which retention is due to weakness of the bladder, in a chronic invalid, are treated by the regular use of a soft rubber catheter, and this forms one of the most important duties in the nursing of such a case.

In any case of retention where the urine accumulates in and causes painful distension of the bladder the condition may often be relieved by the sufferer placing himself in a warm bath. This produces so much relaxation that the bladder often succeeds in emptying itself, a result which is still further assisted by the use of soothing drafts or of suppositories containing morphia or belladonna.

If relief is not gained by these means, the medical attendant withdraws the urine by means of a catheter passed along the urethra. The instrument chosen varies according to the cause of the retention; thus, in cases due to weakness of the bladder or to moderate spasm at the outlet, a soft rubber catheter only is necessary. In cases of severer spasm, and in cases where the prostate gland is enlarged, a flexible instrument or a hard rubber catheter with a peculiar bend upon the point (known as a coudé catheter) is generally chosen; while, in cases of very narrow stricture, the surgeon may require to pass a rigid metal instrument. As a rule, great difficulty is experienced only in the last-named class of cases; and in them it may occasionally be necessary to tap the bladder above the pubis by means of a hollow needle. After its contents have escaped the patient gains immediate relief and can generally pass urine, when it next becomes necessary, by more natural means.

In the cases which require the habitual use of a soft or flexible catheter, such as those due to an enlarged prostate gland, the

patient himself can readily learn to pass the instrument. It is of great importance that this small operation should be regularly performed three or four times daily in order to prevent distension of the bladder, and that the most scrupulous cleanliness should be maintained.

The following formula has been found useful:

℞ Fluidextract of Zea .....one ounce
Dose: One teaspoonful in water three times a day.

ALBUMINURIA

Definition.—Albuminuria means a condition in which albumin is present in the urine. It is of immense importance, both because it is itself a drain upon the health, and because it is often a symptom of serious heart or kidney disease.

Varieties.—Albuminuria is generally divided into two great groups: (*a*) true albuminuria, in which serum-albumin, the albumin of the blood, is excreted by the kidney, thus causing a loss of body substance; and (*b*) false albuminuria, in which either a substance resembling serum-albumin in its reaction to some chemical tests is excreted, or in which albumin is present in the urine from some other source than the kidneys. True albuminuria is again divided into two important classes: (1) functional albuminuria, in which some other organ than the kidney is at fault, causing the kidney, though not apparently diseased, to excrete albumin; and (2) the albumin of Bright's disease of the kidneys.

(*a*) **True Albuminuria.**—Functional albuminuria, although not associated with any discoverable disease of the kidney, is not a trivial matter, because the constant loss of albumin produces a deterioration in health, and if the causes producing it be not removed, Bright's disease may appear later. Almost all fevers, and indeed exposure to external heat, such as working long periods in the sun or before an oven, may bring on the excretion of albumin, which, however, passes off with the end of the fever, after protection from the heat of the sun, etc. Diseases of the blood, such as scurvy, anemia, leucemia, and poisoning by lead or mercury, also produce it, and during pregnancy a transient form may come on, due probably to changes in the blood, which passes off in the later months. When occurring in

pregnancy the case must be most carefully watched lest a severer condition be the cause. Diseases of the heart, especially mitral disease, may cause a very great drain on the strength by albuminuria due to congestion of the kidneys. Epilepsy may cause it in the same way. In young persons albuminuria often comes on independent of disease, and different authorities state that this occurs in from three to ten per cent. of all apparently healthy young people who present themselves for life assurance; the albumin may appear only in the morning, or only after taking food. In the German army it has been found that many soldiers show it after long marches, and it occurs in athletes and others after matches or stiff climbs. It may also occur periodically, and after taking cold baths. All these forms are probably due either to a too highly animal diet, and an attempt by the kidney to relieve the system from a surplus of nitrogenous material, or to a want of tone in the vessels of the kidneys, which allows congestion of these organs to occur.

Bright's diseases show albumin in the urine as their most important symptom.

(*b*) **False Albuminuria.**—Albumoses and peptones may appear in the urine in disorders of digestion and absorption, and in some serious diseases. Egg-albumin may be found when eggs have been eaten in too large quantities for digestion. It must always be remembered too that the albumin may come from some other part of the urinary passages, as in inflammation of the bladder and in spermatorrhea.

Symptoms.—There may be no symptoms whatever, and the albumin may be found only accidentally, as when the person becomes an applicant for life assurance. When, however, its loss has lasted over a considerable period, anemia, weakness, and a vague feeling of ill health come on. There are many symptoms due to the want of tone of the blood-vessels, which is first of all the cause of, and then is kept up by, the albuminuria. These are puffiness of the skin about the eyes and ankles, pallid complexion, dry skin, derangements of the digestion, palpitation of the heart, also vague pains, headache, languor, and weariness on slight exertion.

Treatment.—The treatment for albuminuria in other diseases is given elsewhere. When functional albuminuria occurs a change of diet is necessary; eggs should be avoided, and all

highly albuminous food, such as meat, beans, peas, partaken of very sparingly. The chief cause being want of tone in the blood-vessels, general tonics, especially iron tonics and vascular tonics, like digitalis, are given. Unless bathing be found distinctly injurious (cold baths form the cause in some cases), a cold plunge followed by rapid friction with a towel should be taken daily, and a warm or Turkish bath weekly. Alcohol, which has a special action in weakening the tone of the blood-vessels, must be absolutely avoided in every form. Early rising and moderate exercise are important; and too much sleep on the one hand, and feats of endurance on the other, must be avoided. Most important of all is daily movement of the bowels. Cupping and blisters over the loins are sometimes prescribed, but in slight cases the regulation of food and exercise is generally sufficient.

ACIDITY

Definition.—"Acidity" is a vague term, more used in popular language than in scientific medicine, and meaning that the reaction of the blood, or of one or more of the secretions, is less alkaline or more strongly acid than normal, while a considerable number of symptoms are rightly or wrongly attributed to the condition.

Causes.—The blood, which has to ordinary indicators, such as litmus paper, a strongly alkaline reaction, nevertheless contains a considerable amount of acid salts even in the healthy state; and in diseased conditions, when substances such as urates, sulphur, and phosphorous compounds, which have not been completely oxidized to produce muscular and other forms of energy, are set free in the blood, these acid salts are much increased. All fevers are examples of this condition, and frequently the acidity of the blood (in the above meaning of the word) is doubled, while in the coma in which diabetes ends it may be trebled. But it is of the slighter degrees found in gout, rheumatism, and some similar diseases that we chiefly speak.

The urine normally has a strongly acid reaction due to the same acid salts, and under the above conditions, or even when more animal food is taken than is necessary for the system, the blood and the urine become still more acid. This may lead to a deposit of acid urates in the tissues with a tendency to gout or, if

the urinary acidity be very great, to deposit of uric acid in the urine and formation of gravel or stone in the kidney or bladder. In acute rheumatism the acidity manifests itself very markedly in the sweat, which is more copious and more acid. In gouty persons who suffer from dyspepsia this is peculiarly apt to be due to over-secretion of acid gastric juice. Various skin eruptions are also associated with acidity.

Treatment.—When the above diseases have arisen they must be specially treated; but as the condition is brought on largely by errors in diet, it may be warded off or its effects lessened by diminution in the animal food of those predisposed to it. Also acidity, whether manifested in blood or urine, may be lessened by taking alkalies, viz., sodium or potassium citrate, tartrate, acetate, carbonate, or bicarbonate. These can be conveniently got in green vegetables, lime juice, lemon squash, etc., or in effervescing drinks containing citric or tartaric acid and bicarbonate of soda.

Taking half a teaspoonful of bicarbonate of soda in water before breakfast is most beneficial.

DIABETES

Definition.—Diabetes is a disease described originally by Aretæus in the first century A.D., and characterized by a habitually excessive discharge of urine. There are two forms of the complaint: (*a*) *Diabetes mellitus* or *glycosuria*, in which the urine is not only largely increased in quantity but contains glucose or grape sugar, and (*b*) *Diabetes insipidus* or *polyuria*, in which the urine is simply increased in quantity and contains no abnormal ingredient.

(*a*) **Diabetes mellitus** is a constitutional disorder, and though its causes are still matter of uncertainty, there is sufficient evidence to connect it with a defect in the process of assimilation of food, more especially that stage in which the function of the liver or that of the pancreas is concerned.

Causes.—As the result of important researches, the production of diabetes is ascribed either to some failure of the bodily chemical processes to store up in the liver as glycogen the carbohydrates derived from the food, or, although these chemical processes suffice to store up glycogen, to their inability to use it

as required in maintaining the activity of the muscles. Thus first the material absorbed from the food, and later the fatty and muscular tissues, are broken down, much sugar is excreted in the urine, and substances hurtful to health accumulate in the blood.

It has long been known, both by experiment on animals and by observation of disease, that injuries to certain parts of the nervous system, particularly the floor of the fourth ventricle in the brain, are followed by the appearance of sugar in the urine. Hence it has been supposed that diabetes may be due to irritation or paralysis of the nervous mechanism which regulates the flow of blood to the liver, so that this supply is permanently increased. It is, however, only in a very limited number of cases of diabetes that any change is found in the nervous system after death.

It is found also that in about fifty per cent. of all diabetic cases the pancreas is diseased, softened, shrunken, or otherwise markedly changed, and that this disease may be produced in animals from which the pancreas has been removed. The disease has therefore been attributed to defect of some substance which is normally formed in the pancreas, circulates in the blood, and is necessary to the assimilation of the sugary elements in the food.

Disorders of the thyroid, the pituitary, the suprarenals, or the kidneys have in other cases been associated with diabetes, but the whole pathology is still in a confused state.

It ought to be mentioned that small quantities of sugar are frequently found in the urine in many diseases, and even in health after articles of food rich in sugar or starch have been eaten, as also in some forms of poisoning. The healthy individual can only assimilate about half a pound of sugar at one time; if more be taken it can be found in the urine.

Little is known regarding the exciting causes of diabetes. Exposure to wet and cold, privation, depressing mental emotions, or mental overwork, the abuse of alcohol and of saccharine and starchy substances, have all been assigned as causes. It appears to be in some instances hereditary. It is most common among adults, and occurs much more frequently in males than in females. The Jewish race appears to be specially liable to diabetes, though whether this is a racial peculiarity or due to habits of life is doubtful. Corpulence is often associated with

it, the two in this case probably arising from the excessive use of sugary foods.

Symptoms.—The symptoms of diabetes are usually gradual in the onset, and the patient may suffer for a length of time before he thinks it necessary to apply for medical aid. The first symptoms which attract attention are failure of strength, and emaciation, along with great thirst and an increased amount and frequent passage of urine. From the normal quantity of from two to three pints in the twenty-four hours it may be increased to ten, twenty, or thirty pints, or even more. It is usually of pale color, and of thicker consistence than normal urine, possesses a decidedly sweet taste, and is of high specific gravity (1030 to 1050). It frequently gives rise to irritation of the urinary passages.

One of the most distressing symptoms is intense thirst, which the patient is constantly seeking to allay, the quantity of liquid consumed being in general enormous, and there is sometimes a voracious appetite. The mouth is always parched, and a faint sweetish odor may be evolved from the breath, owing to the escape of acetone and diacetic acid from the blood into the air in the lungs. The effect of the disease upon the general health is very marked, and the patient becomes more and more emaciated. He suffers from increasing muscular weakness, the temperature of his body is lowered, the teeth are decayed, and dyspepsia and constipation are common.

Various skin eruptions appear, boils being particularly common, and in fact sometimes giving the first sign of the presence of the disease. The sugar deposited from the urine is prone to cause intolerable itching about the private parts; and eczema of various parts of the body is set up by the presence of sugar in the sweat. The skin is dry and harsh, with a peculiar papery consistency.

Diabetes as a rule advances comparatively slowly except in the case of young persons, in whom its progress is apt to be rapid. Various complications arise in the course of the disease, among which may be mentioned cataract, paralysis and other symptoms of neuritis, kidney diseases, inflammatory chest affections, and especially pulmonary consumption, which is one of the most frequent modes of fatal termination in diabetes. Occasionally death occurs from exhaustion, or in the peculiar manner,

associated with accumulation of waste products (oxybutyric acid, etc.) in the system, known as diabetic coma, in which the breathing becomes very slow, the person loses consciousness, and death ensues in a few hours or days.

Treatment.—With respect to the treatment of diabetes, the regulation of the diet is of the first importance, inasmuch as certain kinds of food have a powerful influence in aggravating the disease, more particularly those consisting largely of saccharine and starchy matter. Hence such articles as bread, potatoes, and all farinaceous foods, tuberous vegetables, and most sweet fruits should be taken sparingly; while animal food and soups, green vegetables, milk, cream, cheese, eggs, butter, and tea and coffee without sugar may be taken with advantage. As a substitute for ordinary bread, which most persons find it difficult to do without for any length of time, bran bread, gluten bread, almond biscuits, and even well browned toast or rusks in small quantity are recommended. Tea and other beverages may be sweetened by small tablets of saccharine or saxin, which are much sweeter than sugar, and preserves devoid of sugar may be used, such as marmalade consisting of orange rind mixed with glycerine jelly.

The employment of a diet consisting entirely of skimmed milk was recommended by Donkin, who obtained good results from this method of treatment. The milk was administered in quantities of from eight to twelve pints daily, all other articles of diet being excluded.

It is found that diabetic subjects do best when the starchy food is restricted rather than abandoned altogether, both because bread and similar foods make the diet more palatable, and because these carbohydrate foods neutralize the tendency toward the accumulation in the blood of acid substances (oxybutyric and diacetic acids) that result in coma. For this purpose, after a patient has been reduced to a strict diabetic regimen, the physician usually allows him bread or potato in increasing amount; at the same time, by estimating the sugar in the urine, it is observed that no increase of this substance is taking place.

The oatmeal diet which has been recommended by v. Noorden consists of a daily allowance of half a pound of oatmeal which is made into gruel with the addition of three ounces of butter and the whites of from five to eight eggs. This is the only diet given for three days weekly. On the other days a general dia-

betic regimen is pursued with an occasional "hunger day," when nothing but bovril, tea, or black coffee is taken. Whisky and brandy are allowed with the diabetic diet, because they also neutralize the tendency to the onset of diabetic coma.

Numerous medicinal substances have been employed in diabetes, but few of them are worthy of mention as possessed of any efficacy except opium and codeia. Alkaline drafts also help to prevent onset of coma; when required, these may be given as Imperial drink, sweetened with saccharine, which the patient is encouraged to drink freely, or as bicarbonate of soda in water.

Among the *forbidden* articles may be mentioned: thick soups and liver; bread and potatoes (in quantity); sugar, rice, tapioca, semolina, sago, arrowroot, macaroni, Indian corn; turnips, parsnips, carrots, beets, squashes, marrows, artichokes; beer, wines, and sweet drinks.

The following are formulas of good repute:

℞ Boracic Acid ..... three teaspoonfuls
Glycerine ..... one ounce
Liquor Arsenic Hydrochloride .... forty drops
Liquor Strychnine Hydrochloride . forty drops
Water, enough to make ..... eight ounces
Mix.
Dose: Two tablespoonfuls three times a day.

Or:

℞ Eucalyptus Flowers (dried) ..... four drams
Water ..... six fluid ounces
Make infusion.
Dose: One wineglassful twice daily.

(*b*) **Diabetes insipidus** is characterized by constant thirst and an excessive flow of urine, which, however, is not found to contain any abnormal constituent. Its effects upon the system are often similar to those of *diabetes mellitus*, except that they are much less marked, the disease being in general very slow in its progress. In some cases the health appears to suffer very slightly. It is rarely a direct cause of death, but from its debilitating effects may predispose to serious and fatal complications. Little is known as to its pathology, but it is generally supposed to own a similar origin to diabetes mellitus.

Treatment.—It is best treated by tonics and generous diet. A useful formula is:

℞ Zinc Valerate .....five-grain capsules

Dose: Take one capsule three times a day.

Or:

℞ Fluidextract of Ergot .....one-half ounce

Dose: Ten drops in water three times daily.

UREMIA

Definition.—Uremia is the condition which results when the poisonous materials that should be passed from the body in the urine are retained in the blood. The condition may be due to failure of the kidneys to secrete urine as the result of Bright's disease or of disorganization by tuberculosis, tumors, abscesses, etc., or, in cases where the kidneys are sound, may be due to blocking up of the urinary passages. How this condition produces its peculiar symptoms is not quite settled. It seems unquestionable that in most cases the result is brought about mainly by the action of poisonous substances on the nervous system, though in some cases the dropsy that accompanies the condition probably plays a part in the production of the symptoms.

Symptoms.—Uremia is sometimes classed as *acute,* i.e., those cases in which the symptoms develop in a few hours or days, and *chronic,* including cases in which the symptoms are less marked and last over weeks, months, or years. There is, however, no dividing line between the two, for in the chronic variety, which may be said to consist of the symptoms of chronic Bright's disease, an acute attack is at any time liable to come on.

Headache in the front or back of the head, accompanied often by insomnia at night and drowsiness during the day, is one of the commonest symptoms, though it is apt to be attributed to some other cause. Unconsciousness of a profound type, which may be accompanied by convulsions resembling those of epilepsy, is the most outstanding feature of an acute attack and is a very dangerous condition. If the person lives through an acute attack, he may suffer later from blindness, deafness, delirium, or some mild type of insanity characterized by delusions or by melancholia, or on the other hand he may make an apparently good recovery.

Another group of symptoms is associated with the lungs and may consist of great difficulty in breathing when the patient attempts to lie down, repeated attacks resembling asthma, or the peculiar type of breathing known as Cheyne-Stokes breathing.

Still another symptom, which often precedes an acute attack, is severe vomiting without apparent cause.

Treatment.—The treatment of the chronic type of uremia includes all the measures which should be taken by a person suffering from chronic Bright's disease. In the acute form treatment must be immediate and energetic if the patient's life is to be saved. It consists mainly in getting the skin and bowels to perform the functions which the kidneys are unable for the time to overtake. Hot-air baths, hot packs, and diaphoretic drinks act upon the skin, while smart purgatives like compound jalap powder or even croton oil produce watery movements of the bowels and so relieve the kidneys. The withdrawal of blood from the loins, usually by wet-cupping, helps also to diminish the congestion of the kidneys, and so enables these organs to resume their normal activity. When convulsions are present, these are relieved by the inhalation of chloroform or administration of chloral.

THE URETHRA AND ITS DISEASES

Definition.—The urethra is the tube which leads from the bladder to the exterior, and by which the urine is voided. It is about 8 inches long in the male and 1½ inches long in the female. The urethra, being merely a tube, is not liable to many diseases. The chief conditions, however, which cause pain in the urethra, or interfere with the passage of urine, are urethritis, or inflammation of the mucous lining, and stricture or narrowing of the tube.

URETHRITIS

It is often difficult to distinguish urethritis from inflammation of the bladder (cystitis), which, however, it may accompany and of which it is frequently the cause.

Causes.—The most frequent cause of urethritis is undoubtedly gonorrhea, and this disease produces the most severe type of inflammation. Gout is another common cause, producing its

effects either owing to the repeated passage of irritating gravel with the urine, or to a highly acid state of this excretion. The damage caused by the passage of a rough stone from the bladder or of a catheter unskilfully introduced may also occasion a severe urethritis; and various drugs or articles of diet, such as alcohol or arsenic, may bring on an attack in those who are liable to suffer from it.

Symptoms.—The symptoms consist chiefly in the constant oozing out of a small quantity of pus from the orifice of the urethra, a sense of scalding pain whenever urine is passed, increased redness of the mucous membrane as seen at the orifice, and tenderness along the course of the urethra. Subsequently, inflammation in neighboring organs, viz., the bladder, testicle, or even kidney, may be set up.

Treatment.—This varies with the cause of the inflammation, but in all cases the drinking of milk, water, and other bland fluids in large quantities is of advantage in order to flush out the urethra. The disease causing the inflammation requires special treatment according to its nature, and, in addition, recourse is often had to local applications such as bougies of cocoa-butter and iodoform, astringent injections, etc.

The cause of this disease must first be ascertained and removed or treated. The formula given below will decrease the inflammation in the vicinity of the vagina and surrounding tissues:

℞ Bichloride of Mercury . . .one and one-half drams
Ammonium Chloride . . . . .one and one-half drams
Methylene Blue . . . . . .one-sixtieth (1/60) grain
Water, enough to make. .eight fluid ounces

Mix.

Directions: Add a tablespoonful to two quarts of hot water and use as a douche twice a day.

THE BLADDER AND ITS DISEASES

Definition.—Bladders are sacs formed of muscular and fibrous tissue and lined by a mucous membrane, whose surface is covered by smooth cells, and which is united loosely to the muscular coat, so as to allow freely of increase and decrease in the contained cavity. Bladders are designed to contain some secretion

or excretion, and communicate with the exterior by a narrow opening through which their contents can be discharged. In man there are two, the gall-bladder and the urinary bladder.

The urinary bladder is situated in the pelvis, in front of the last part of the bowel. The bladder, in the full state, rises up into the abdomen and holds about a pint of urine. Two fine tubes, called the ureters, lead into the bladder, one from each kidney; and the urethra, a tube as wide as a lead-pencil when distended, leads to the exterior, a distance of several inches.

Structure.—The wall of the bladder is similar in structure to that of the bowels, and consists of four coats. The inner surface is lined by a soft mucous membrane covered by epithelial cells of irregular shape. This is attached to the muscular coat by a loose, fibrous, submucous coat, in which run numerous blood-vessels. In the muscular coat the muscle fibers are arranged in several layers, and run in various directions, thereby adding greatly to the strength of the wall. On its upper and back part, the bladder possesses a covering of serous membrane, formed by part of the general peritoneal lining of the abdominal cavity, but this outermost coat does not extend down to the base of the bladder, where the latter lies in close contact with the other pelvic organs. The bladder is suspended in position by numerous ligaments, four of which are fibrous bands, while the remaining five are formed by thickened portions of the peritoneum. The base of the bladder is directed downward and backward, and in this part are the three openings of the ureters and urethra. The exit from the bladder is kept closed by a muscular ring, which is relaxed every time water is passed.

NEPHROLITHIASIS—GRAVEL AND STONE IN THE BLADDER

Gravel and stone are produced by the deposit in the urinary passages of solid substances which are naturally present in the urine, and whose deposition depends upon their presence in excessive amount, or upon the failure of some condition which in general keeps them in solution. These crystalline deposits are of three sorts: (*a*) urates and uric acid; (*b*) oxalates; (*c*) phosphates.

(*a*) Urates are naturally present in the urine in large amounts, but remain dissolved, unless under the following conditions they

are thrown down or converted into uric acid. This is apt to occur if the urine be very acid, or if it be poor in salts, as in people who live too entirely upon rice and similar diet, or if it be very pale in color from lack of urinary pigment, or, finally, if the diet be very rich in animal food. (*b*) Oxalate of lime is contained in most vegetable foods, and it may possibly be derived from uric acid also. The presence of an excessive amount in the urine is often associated with the condition of dyspepsia, melancholy, etc., known as hypochondriasis. (*c*) Phosphates are seldom deposited in the kidney unless the urine is alkaline and decomposing; and therefore gravel and stones of this substance are found, as a rule, only with serious suppurative conditions of the kidney, and are of little importance compared with the condition leading to their formation.

Treatment.—When attacks of renal colic, blood in the urine, etc., have led to the supposition that a stone is forming in the pelvis of the kidney, it is usual, in addition to any surgical means which may be taken with the object of removing the stone, to treat the patient with a view to diminishing its size if possible, and, at all events, to preventing the formation of other stones. When the stone is of uratic nature, the general treatment, mentioned under ACIDITY, is adopted; larger quantities of common salt and other salines are taken; the bowels and liver are regularly stimulated to action, and foods of highly albuminous nature are diminished. When the stone is oxalic, careful attention is paid to the digestive organs, but such a stone will not dissolve. When the stone is phosphatic the condition causing its formation must be treated.

When stone is uratic in nature, use the following formula:

℞ Potassium Bicarbonate .....forty grains
Lithium Citrate .....twenty grains
Mix and dissolve in one quart of water.
DIRECTIONS: Take a glassful at frequent intervals, drinking one quart a day.

When stone is phosphatic in nature, use this formula:

℞ Benzoic Acid .....ten-grain powders
DIRECTIONS: Dissolve one powder in one quart of water and take a glassful at frequent intervals, drinking one quart a day.

Or:

℞ Boracic Acid .....ten-grain powders

Directions: Dissolve one powder in one quart of water and take a glassful at frequent intervals, drinking one quart a day.

CYSTITIS—INFLAMMATION OF THE BLADDER

Causes.—Bacteria live readily in the urine but they do not multiply in the healthy bladder. When some cause is present to weaken the bladder wall, or when bacteria are introduced in large numbers, for example on a dirty catheter, they multiply inside this organ and set up inflammation. In the course of a severe chill a mild cystitis may develop, but gets well in a few days or weeks. A severer form may come on in typhoid fever, pneumonia, and other weakening diseases. There may be direct infection from neighboring organs, as the rectum in cancer, the urethra in gonorrhea. Any cause that prevents the free voiding of the urine, such as stricture or narrowing of the urethra, or enlargement of the prostate gland at the outlet of the bladder, which is a common occurrence in elderly men, may produce a chronic form of cystitis. A stone, if present, is apt by its irritation to do the same. Tuberculous cystitis may be found, due to the tubercle bacillus which produces a chronic ulcer on the bladder wall. It is a very difficult condition to treat. Another very chronic form is caused by bilharzia, a small parasitic worm which may settle in the minute blood-vessels of the bladder wall. This form is very common in Egypt and South Africa, and is sometimes found in those who have resided in these countries.

Symptoms.—Pain in the region of the bladder or in the small of the back, frequency of making water, and a condition of bad smell, turbidity, and whitish sediment in the water, are the chief facts noticed by the sufferer. There may in acute cases be high temperature and shivering fits. In the chronic form the very frequent desire to pass small quantities of water is the most marked symptom.

Treatment.—Rest in bed, hot hip baths, and hot applications, like poultices or fomentations to the lower part of the abdomen or the fork, along with simple diet and large quantities of water

to drink, may be all that is necessary. When pain is severe, various sedatives are given, and, when there is much pus in the water, the bladder is often washed out through a catheter with boracic acid solution (1 to 80), nitrate of silver (1 to 2000), or perchloride of mercury (1 to 20,000). In the chronic form similar treatment is adopted. Drugs like urotropine, salol, and benzoate of ammonium, which lessen decomposition in the urine, are also given, and the original cause, be it a stone, stricture, tuberculous ulcer, etc., must be removed.

Neuralgic pain in the bladder is often periodic and associated with frequency of passing urine. It is very often due to dyspepsia and constipation.

The following prescriptions have been found very beneficial:

℞ Benzoate of Soda .....two teaspoonfuls
Urotropine .....one teaspoonful
Water .....four ounces
Mix.
Dose: One teaspoonful in half a glass of water three times a day.

Or:

℞ Lithia .....five-grain tablets
Directions: Dissolve one tablet in half a glass of water and take four doses a day.

Or:

Pumpkin-seed.—Take two ounces of dried pumpkin-seed an crush thoroughly. Add one quart of boiling water and let it steep for fifteen or twenty minutes; then strain.

Dose: One teacupful every three or four hours.

Or:

℞ Oil of Pumpkin-seed .....two drams
Dose: Seven drops in water four times a day.

Or:

Parsley.—Two ounces of parsley roots steeped in one quart of boiling water for thirty minutes; strain and add ten drops of sweet spirits of niter.

Dose: One glassful three times a day.

DISEASES OF THE SKIN

ACNE—BLACKHEADS

ACNE is a chronic skin disease affecting the forehead, nose, chin, chest, back of the shoulders, and outer side of the thighs, or one or more of these regions.

Causes.—It is found especially in young persons of both sexes between about fourteen and twenty years of age, especially in those who suffer from cold hands and feet, chilblains, and slow circulation. Constipation makes it worse, and in many cases it is associated with dyspepsia or other irregularities. Any local irritation, such as a rough or soiled hat-band on the forehead, may bring out a crop of acne pimples in those who suffer from the disease. Want of effective washing, with insufficient exercise and perspiration, causing sluggish action of the skin glands, renders it much worse. The suppuration has been attributed to various bacteria.

Symptoms.—There are various general symptoms, such as constipation, dyspepsia, bad circulation, which act as causes. The eruption itself consists of little black spots which indicate the mouth of small sebaceous ducts choked with dust or dirt, from which a long, wormy-looking, fatty mass can be squeezed; hard pimples generally showing one of these "blackheads" on the top; little pustules surrounded by a slight degree of inflammation, which gradually grow, burst, and then heal; and hard lumps, sometimes half an inch across, which last for weeks or months, slowly suppurate, and leave a permanent hardness or scar.

Treatment.—The general health must be looked to, and dyspepsia, constipation, and similar errors treated. If the general health and physique be poor, cod-liver oil is very useful, or various other tonics may be taken. Sometimes anemia needs treatment by iron. If the subject of the disease lead a sedentary or inactive life, active exercise—such as in tennis, football, cy-

cling—should be taken, and the hygiene of the whole skin should be attended to by cold baths, rough towels, etc. The most important point in treatment is the daily washing of the affected areas with soap and *hot* water; after which they should be quickly immersed in cold water. The soap used should be plain Castile soap, or, if the skin be very fine, a superfatted soap. After washing, the skin should be well rubbed with a flesh-brush or towel. To stimulate the glands and check the suppuration, various substances are used, such as sulphur ointment rubbed in every night, bathing with a weak solution of perchloride of mercury (one part in 20,000 of water) night and morning, or bathing with eau de Cologne. The contents of the sebaceous glands, wherever a blackhead shows, should be regularly squeezed out, by gentle pressure with a fine tube or "comedo-extractor," after washing. The suppurating lumps may be touched with a match sharpened to a point and dipped in pure carbolic acid, only a minute drop being applied; this helps their disappearance. Vaccines prepared from the bacteria in the pimples are also given by injection.

In ordinary cases the following remedy will be found beneficial:

℞ Zinc Oxide .....three drams
Calamine .....two drams
Glycerine .....one fluid dram
Lime-water .....six fluid ounces
Mix.

Directions: Apply with soft cloth, night and morning.

In chronic cases, remove the sebaceous plugs, wash thoroughly with tincture of green soap, and apply the following:

℞ Ammoniated Mercury .....twenty grains
Cold Cream .....one ounce
Mix.

Directions: Apply night and morning.

ACNE ROSACEA

This is a chronic inflammation of the face, especially of the nose; it is associated with enlargement of the minute blood-vessels, leading to lumpiness and causing a red or dusky copper color.

Causes.—It may occur in the subjects of chilblains and dyspepsia, but is generally, in severer forms at least, due to excessive use of alcohol.

Symptoms.—In the milder forms, associated with chilblains or dyspepsia, there is simple redness, burning, and tingling of the nose, the redness lasting at first only for a few hours every day, but later tending to become permanent, and also to appear upon the cheeks. This form occurs especially in women from thirty to sixty years of age. In the severer form the nose becomes very red and the skin thick and lumpy, while the openings of the sebaceous glands are seen as quite wide pits.

Treatment.—The mild form is lessened by attending to the dyspepsia, or the bad circulation which is its cause; avoiding exposure to cold winds, and the irritation of a veil resting on the nose; and by painting with Goulard's water, or by application of hazeline snow. The severer form is only to be treated by avoiding alcohol, and by the division with a lancet of the enlarged veins here and there, to cause scarring and contraction, or by the actual removal of pieces of skin.

In chronic cases, wash thoroughly with tincture of green soap, and apply the following:

℞ Ammoniated Mercury .....twenty grains
Cold Cream .....one ounce
Mix.
Directions: Apply night and morning.

BERIBERI

Definition.—Beriberi is a tropical disease sometimes known by the Japanese name of *kakke*. The chief symptoms are paralysis, dropsy, palpitation, and breathlessness. This disease is met with in almost all tropical and subtropical countries, but especially in the Malay Peninsula and East Indies.

Causes.—Conditions of overcrowding seem to have a great deal to do with its causation; coolie-camps, ships, jails, barracks, etc., are the places where it may be expected. Another important factor is diet, and most authorities lay stress on rice of poor or diseased quality as being the essential cause of the disease.

Symptoms.—The symptoms are due to an inflammation of the nerves all over the body. Cases vary greatly in their severity. The mildest have only some pain, weakness, and numbness in the legs, with perhaps a little palpitation; these usually recover in a few months. More severe cases become feverish and weak, their legs become quite paralyzed and wasted, and there is loss of sensation in patches of skin all over the body; this is called "dry beriberi." In the "wet" form there is, in addition, dropsy, beginning in the feet and spreading upward, and dilatation of the heart, showing itself in pain over the heart, palpitation, and breathlessness. In the severest forms, which generally attack strong, vigorous men, all these symptoms develop in the course of a few days, and the patient almost invariably dies in agony.

Treatment.—Medical aid should always be obtained. We would just indicate that it is desirable, whenever possible, to remove the invalid at once to high ground or to put him on board ship. He should be put on a liberal diet, containing plenty of meat and fats. For the dropsy and palpitation digitalis is the remedy usually employed, but it is a drug whose use needs constant skilled supervision. The paralyses are to be treated in the same way as those resulting from any other form of neuritis. It may take a year, or even longer, for complete recovery.

The average duration of cases of moderate severity is between three and ten weeks. Chronic cases are treated the same as multiple neuritis. In early stages, give saline laxatives. The following formula has been found beneficial:

℞ Diluted Nitric Acid .....four fluid drams
Diluted Hydrochloric Acid.four fluid drams
Syrup of Orange Peel .....two fluid drams
Water .....one and one-half ounces
Mix.
Directions: One teaspoonful in water before meals.

CHAFING OF THE SKIN

Chafing occurs in infants at the natural folds in the groins, armpits, elbows, where two moist surfaces constantly rub one another; in stout elderly people it occurs at similar positions; and generally where the clothes cause friction or continued pres-

sure, as in the armpits or on the feet of those who walk great distances.

Treatment.—In infants the folds in the skin should be kept specially clean by washing with warm water and superfatted soap, carefully dried, and then dusted with fuller's earth or any dusting-powder, such as a mixture of starch, zinc oxide, and subnitrate of bismuth in equal parts.

Chafing beneath the breast, etc., is treated by similar careful washing, drying, and dusting, with, in addition, suitable support and separation of the skin surfaces by dry wool or a fold of boric lint.

Chafing by the clothes may generally be cured by drying and dusting with the above powder, or with one of boric acid and starch in equal parts, or by sponging the skin three or four times a day with strong alcohol solution.

Chafing of tender feet, or "foot soreness," may be prevented or treated as follows:

(*a*) Shoes should be thick-soled, sound, and for some weeks before a long march should be softened by repeated greasing or by soaking in castor-oil.

(*b*) Absolute cleanliness of the feet is essential, and they should be hardened by bathing twice daily in water containing alum (a handful to a pail of water) or potassium permanganate (dark red color), or other hardening agent like weak chromic acid or weak formalin.

(*c*) Socks should be dusted with French chalk or other powder, and a clean pair should be carried for changing.

(*d*) At the end of each day's march any blisters should be pricked, though the white skin is not to be removed; and reddened areas should be washed with potassium permanganate solution, dried, sponged with alcohol, and dusted with talcum powder.

℞ Starch ..... one-half ounce
Zinc Oxide ..... one-half ounce
Subnitrate of Bismuth ..... one-half ounce
Mix.
Directions: Dust on affected parts.

Or:

℞ Stearate of Zinc .....one ounce
Directions: Dust on affected parts.

CHILBLAINS

Definition.—Chilblain is an inflamed condition of the skin of the hands or feet, or even of the ears, occurring in persons of defective circulation and poor health.

Causes.—Chilblains are found especially in weakly children in winter time. Under-feeding, poor clothing, and a strumous constitution favor their appearance. Persons who suffer from them have habitually cold and numb hands and feet, and are subject to chills and colds in the head. In these persons, tight shoes often are sufficient to bring on chilblains of the feet, and warming the hands at the fire when they are cold produces chilblains on the fingers, the skin becoming engorged with blood in consequence of the irritation or warmth, and later losing its vitality.

Symptoms.—The state of the general health is usually feeble in affected persons. There are three stages in the development of a chilblain:

First, the skin, usually of the little toe, the outer side of the foot, or the inner side of the hand, becomes purple and very itchy.

Second, blisters, containing a thin yellow fluid, form on this discolored area, which becomes very painful.

Third, these blisters break and leave behind an ulcerated surface very difficult to heal.

True chilblains should not be confounded with a cracked or "chapped" condition of the hands, feet, lips, or ears brought on by cold wind, or washing with hot water during cold weather in persons of robust constitution but delicate skin. This condition yields to the same treatment as chilblains, but more easily.

Treatment.—Preventive treatment is the best. Good food, tonics, and warm clothing improve the general condition upon which chilblains depend. Regular exercise and a cold or modified cold bath every day improve the circulation. The person liable to chilblains should wear wide shoes and thick woolen socks in winter, and before going into the open air should always pull on a pair of woolen gloves. Garters and constrictions around

the wrist or ankle, which interfere with the circulation, should be abolished, and india-rubber shoes should not be worn. If the hands and feet are cold they should be rubbed for warmth, not held before the fire. In the first stage the chilblain may be rubbed with hazeline snow or cream, or painted with tincture of iodine. Voyagers to the Arctic regions rub the part with a mixture of whisky and soap, which is very effective. In the second and third stages some simple ointment like zinc salve, applied freely over the affected parts, brings relief.

CYSTS—TUMORS

Definition.—Cysts are hollow tumors containing fluid or soft material. They are almost always simple in nature and seldom return after removal, though in the case of certain types there are apt to be several of various sizes.

Varieties.—(*a*) *Retention Cysts.*—In these some cavity which ought naturally to contain a little fluid becomes, in consequence of irritation or other cause, distended to a great extent, or the natural outlet from the cavity becomes blocked. The swellings, known as ganglions, which form in connection with the sinews, such as those behind the wrist, afford an example of a cyst containing an excess of the fluid, which in the natural stage merely lubricates the sinew in its movements. Wens are caused by the blockage of the outlet from sebaceous glands in the skin, so that an accumulation of fatty matter takes place. Ranula is a clear swelling under the tongue, due to a collection of saliva in consequence of an obstruction to a salivary duct. Cysts in the breasts are, in many cases, the result of blockage in milk ducts, due to inflammation. Cysts also form in the kidney as a result of obstruction to the free outflow of the urine.

(*b*) *Developmental Cysts.*—Of these the most important are the huge cysts that originate in the ovaries. The cause is doubtful, but the cyst commences probably at a very early period of life, gradually enlarges, and buds off smaller cysts from its wall. The contents are usually a clear gelatinous fluid. Very often both ovaries are affected, and the cysts may slowly reach a great size, often, however, taking a lifetime to do so.

A similar condition sometimes occurs in the kidney, and the

tumor may have reached a great size in an infant even before birth.

Dermoid cysts are small cavities, which also originate probably early in life, but do not reach any size till fairly late in life. They appear about parts of the body where clefts occur in the embryo and close up before birth, such as the corner of the eyes, the side of the neck, the middle line of the body. They contain hair, fatty matter, fragments of bone, scraps of skin, and even teeth.

(*c*) *Hydatid Cysts* are produced in many organs, particularly in the liver, by a parasite, which is the larval stage of a tapeworm found in dogs. They occur in people who keep dogs and allow them to contaminate their food.

(*d*) *Cysts in Hard Tumors* occur occasionally, especially where these tumors spring from glands.

Treatment.—The best treatment for cysts of all sorts is complete removal by careful dissection, after which they do not recur. Failing this, in the case of small cysts the contents may be let out, the inner surface of the cyst wall destroyed by scraping, or by injecting irritating fluids, and the cavity compelled to close completely from the bottom by stuffing the opening leading to the exterior, so as to prevent it from closing too quickly. However, this should be done only by the skilled surgeon.

ECZEMA—TETTER

Definition.—Eczema is a disease of the skin which is not contagious but is inflammatory, and may be either acute or chronic.

Causes.—It occurs chiefly in children and old folks. It may be due to disturbances of the digestive organs or gastro-intestinal tract, to blood conditions, to external irritants such as cold, heat, or the ivy-plant, and to the use of hard soaps and impure soaps. Factory workers employed in dye or color-making places are also very susceptible to this disease.

Varieties.—There are many different kinds, of which the following are the most common:

Eczema Rubrum.—Raw, dark red surface is moist and covered with yellowish-red crusts, with severe itching; may be on face or extremities.

Eczema Erythematosum.—Exhibits many irregular patches

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ECZEMA

which are swollen and red, with itching and burning; generally is found on the face.

Eczema Pustulosum.—Characterized by a collection of minute pustules, while itching is either not present or is not severe. The pustules break and form a thick, yellowish crust. It occurs mostly on the face and scalp of the poorly nourished.

In general, the forms of eczema exhibit a condition of pustules which burst and dry up, forming scales and crusts due to the infiltration in them; itching and burning is, as a rule, more or less present. Careful attention must be paid in diagnosing cases of eczema in preference to acne, sycosis, scabies, the eruption arising from syphilis, and the many other diseases which appear on the skin surfaces.

Treatment.—The cause must be ascertained and removed; as a rule, the personal health and hygiene need looking after. Attention must be paid to the kidneys, usually by copious drinking of water in which sodium bicarbonate or other alkalies are added. The bowels must also be kept open by the use of saline waters or Epsom salts. Proper digestion and increased nutrition are generally needed, and the errors here ascertained are to be treated locally. For nutrition, the following is recommended, along with corrections in the diet:

℞ Emulsion of Cod-liver Oil and
Hypophosphates .....twelve fluid ounces
Dose: Two teaspoonfuls after meals.

Externally, the following prescriptions will render help in alleviating the inflammation and itching:

℞ Calamine Solution .....two ounces
Directions: Keep parts moist.

Or:

℞ Boric Acid .....one teaspoonful
Water .....one teacupful
Directions: Keep parts moist.

Where there exist scales or crusts caused from the exudations, the parts should be washed often and kept free from them by the use of tincture of green soap or of pure Castile soap. Then the parts should be washed with boric acid solution and one of

the following ointments used (the parts to be redressed each day):

℞ Ichthyol .....two drams
Lanoline .....two ounces

Or:

℞ Ichthyol .....one dram
Tar Ointment .....one dram
Zinc Oxide Ointment .....two ounces

Or:

℞ Zinc Oxide Ointment .....one ounce
Boric Acid Ointment .....one ounce

ELEPHANTIASIS—BARBADOS LEG

Elephantiasis is a term applied to a disease which is characterized by a peculiar overgrowth of the skin and subjacent textures. This condition appears to arise from repeated attacks of inflammation of the skin and concurrent obstruction of the veins and lymphatic vessels of the part. It has recently been attributed to the presence of certain parasitic worms in the lymphatic vessels. It may attack any portion of the body, but most commonly occurs in one of the legs, which becomes so enlarged and disfigured by the great thickening of its textures as to resemble the leg of an elephant, whence the name of the disease is derived. The thickening is due to excessive increase in the connective tissue, which results from the inflammatory process, and which by pressure on the muscles of the limb causes them to undergo atrophy or degeneration. Hence the limb becomes useless. This disease is most frequent in tropical climates. When affecting the scrotum it frequently produces a tumor of enormous dimensions. There is in general little pain attending elephantiasis, which is essentially a chronic disease. The health, however, ultimately suffers, and serious constitutional disturbance is apt to arise. In the earlier stages of this disease great relief or even a cure may be effected by the persistent employment of wet bandages applied tightly to the limb from the toes upward, as recommended by Hebra. The bandages are kept wet with the following formula:

℞ Sugar of Lead and water .....eight ounces

Use as directed.

Ligature of the main artery of the affected limb has also been employed successfully, while amputation, which was formerly the only remedy employed, may occasionally be called for. In the case of tumors, the only remedy is excision. This disease is totally different from the so-called *Elephantiasis Græcorum*, or true leprosy.

ERYTHEMA

Definition.—Erythema is a general term signifying several conditions in which areas of the skin become congested with blood, and consequently a red eruption appears. The eruption is accompanied by tingling, and often by itching and pain.

Causes.—It may be due to heat, such as exposure to the sun, or the constant exposure, by cooks or iron-workers, of the face, hands, or legs to a blazing fire. Another form, known as *erythema pernio*, is due to exposure to cold and wet. A third variety, which appears, usually on the front of the legs, in the form of red or livid, tender swellings, often over an inch in breadth, is known as *erythema nodosum*, and is almost always a manifestation of rheumatism, though it also follows sometimes upon infectious diseases like measles. In infants suffering from dyspepsia or diarrhea, a form of erythema, very like the rash of scarlatina, may appear quickly over the whole body. Adults may also, especially in the spring and autumn, owing probably to errors in diet, suffer from a severer form, which begins as red blotches on the hands, and, spreading up the arms to the body, produces lumps and vesicles, or even large blisters full of fluid. This form, on account of the diversity of the appearances in different parts, is known as *erythema multiforme*.

Treatment.—If the bowels are carefully regulated, and any article of diet which produces indigestion is eliminated, frequently the condition quickly vanishes. Erythema nodosum yields to the ordinary remedies for rheumatism. For tingling and itching the discolored parts may be dusted with a powder containing:

℞ Boracic Acid .....one ounce
Zinc Oxide .....one ounce
Powdered Starch .....one ounce
Mix.

Early cases of the far more serious condition, erysipelas, may be mistaken for erythema, but require much more energetic treatment as well as isolation.

FRECKLES—SUMMER SPOTS

Definition.—Freckles or summer spots are small yellow or brown spots which appear on the exposed parts of the body, such as face, neck, and hands, during hot or windy weather. They appear especially in people with delicate skin, on blonds oftener than brunettes. Exposure to sun serves as an exciting cause. They consist of small pigmented areas in the deeper part of the cuticle, which are stimulated to increased development by exposure.

Treatment.—They can be removed, but almost always return. The following will prove beneficial:

℞ Bichloride of Mercury .....three grains
Alcohol .....two fluid ounces
Water .....two fluid ounces
Mix.
Directions: Paint skin morning and night.

FROST-BITE

Causes.—Frost-bite results from the action of extreme cold upon parts of the body for some time. Parts may be frozen for a short time, as in surgical operations, without injury; but when considerable portions, such as a whole hand, are frozen for a lengthened period, and particularly when the circulation is allowed to return too suddenly, the more outlying portions like the fingers are very apt to die and be separated from the living parts by gangrene.

Symptoms.—The condition is particularly apt to arise in persons addicted to the use of alcohol, whose blood-vessels have lost their proper "tone," and in whose extremities circulation is sluggish. A part may, by long exposure, be so frozen that the circulation never returns in it, and in this case the part may simply shrivel up, turn black, and undergo dry gangrene without any inflammation. If, however, the freezing process has not been so severe, circulation becomes restored as the part thaws,

the vessels in it become widely dilated, and the part in consequence swollen, red, and excessively painful. If this reaction be not controlled, the result is a considerable inflammation in the part, which may go on to moist gangrene and consequent death of the part.

It is said that the greater the redness which appears in the part the poorer the chance of recovery.

Treatment.— The condition is, of course, preventable by keeping the outlying parts of the body, like hands and feet, carefully wrapped up when the cold is intense, and also by maintaining the circulation in full activity by not sitting down, and by avoiding alcohol. Supposing, however, that a part has been frozen, its recovery depends upon the extent to which the reaction is controlled. The person should be put in a cold room, the frozen parts rubbed with snow or immersed in cold water, and all stimulants avoided unless the general condition be very feeble. If the reaction becomes excessive and the part very red, both this and the pain may be lessened by raising the affected limb, the person reclining on his back. After a time gentle rubbing with the hand well oiled may be commenced, but the longer the part has been exposed to the cold the longer should be the time that is spent upon its restoration. Finally, when the circulation is restored, the part should be lightly wrapped in absorbent cotton.

If skin is unbroken the following is good:

℞ Tincture of Iodine .....one fluid ounce

Directions: Apply with brush once or twice a day.

If pain is suffered, use:

℞ Solution Subacetate of Lead .....one fluid ounce
Tincture of Aconite .....one fluid ounce
Water .....fourteen ounces
Mix.

Directions: Apply freely on well moistened soft cloth.

As a general treatment, the following is used:

℞ Balsam of Peru .....two drams
Ichthyol .....two drams
Wool Fat .....four drams
Mix.

Directions: Apply freely to affected part.

HERPES

Definition.—Herpes is a skin eruption of acute nature, consisting in the appearance of small yellow vesicles, which spread over a greater or less area, dry up, and heal by scabbing.

Varieties.—Herpes zoster, or shingles, is the best known form. It receives its name from a Greek word signifying a surcingle, or girdle, because it spreads in a zone-like manner round half the chest. Herpes of the face also occurs, particularly on the brow and round the eye. Herpes of the lip is a very trifling condition which arises during the course of pneumonia and other febrile conditions.

Causes.—The direct cause of the appearance of herpes is some affection of the nervous system. As a rule, an attack is due to inflammation limited to a single nerve in the wall of the chest, but more than one are sometimes affected. The inflammation may also be seated in the fifth cranial nerve, and manifest itself as herpes of the face.

Both sexes suffer from it equally, and young persons are much more frequently affected than old. Cold appears sometimes to be the cause, and herpes rarely shows itself in those who are thoroughly robust, but usually in persons recovering from some acute disease, suffering from some weakening condition like consumption, or some disorder of the nervous system, or in those who have passed recently through much worry and hard work. Sometimes, too, it is a sign of the presence of pleurisy which is not causing sufficient pain to attract attention. Herpes may also, though rarely, be a symptom of some grave disease in the spinal cord or spine.

Symptoms.—The first symptoms of herpes are much like those of any feverish attack. The person feels unwell for some days, has a slight rise of temperature, and vague pain in the side or in various other parts. The pain finally settles at a point in the side, and two or three days after the first symptoms the rash appears. Minute yellow blisters are seen on the skin of the back, of the side, or of the front of the chest, or simultaneously on all three, the points corresponding to the space between one pair of ribs right round. These blisters increase in number for some days, and spread till there is often a complete half girdle round

one side of the chest. The pain in this stage is severe, but it appears to vary a good deal with age, being slight in children and very severe in old people, in whom indeed herpes forms a serious malady. After one or two weeks most of the vesicles have dried up and formed scabs, which finally drop off, leaving the skin just as it was before, or covered with small scars. Occasionally the little vesicles run together into large blisters, which leave ulcers difficult to heal, and followed by marked scars. The skin is generally healed completely in two or three weeks, but a peculiarity about the pain is that, in old people especially, it may not pass off when the eruption disappears, but may remain for weeks or even months.

Treatment.—If any cause for an attack of herpes be known, it should be removed. Thus, if the affected person be in poor health, tonics are necessary; if he be of rheumatic constitution, salicylate of soda, and so on. In the very early stage, before the vesicles have formed, cocaine or atropine ointment rubbed into the side eases the pain and seems to prevent to some extent the outbreak of the eruption. Later, when the vesicles have formed and are discharging, a dusting powder of starch, zinc oxide, and bismuth subnitrate does most good, or the side may be painted with glycerine jelly containing menthol or various other medicaments. In any case the part should be kept warm by a dressing of absorbent cotton.

The following remedy will be found beneficial:

℞ Boracic Acid .....ten grains
Menthol .....two grains
Vaseline .....one-half ounce
Mix.
Directions: Apply to affected parts.

Or:

℞ Powdered Camphor .....forty grains
Zinc Oxide .....two ounces
Starch .....four drams
Mix.
Directions: Dust on affected surfaces.

Or:

℞ Spirits of Camphor .....two fluid ounces
Directions: Apply several times daily.

IMPETIGO

Impetigo is a skin disease of an infectious nature often found in schools, and apparently peculiarly liable to be communicated from one boy to another at football. It consists of vesicles which appear here and there, on the face particularly, and dry up, leaving thick brown scabs from which the discharge is infectious. These scabs fall off, leaving no scars, but the disease spreads from place to place over the skin, and may last for months if untreated. The eruption quickly disappears, as a rule, when treated with:

℞ Ammoniated Mercury .....one dram
Vaseline .....seven drams
Mix.
Directions: Apply to affected parts.

Various other antiseptic applications of a mild nature are also used.

ITCH—SCABIES

Definition.—Itch is a contagious skin disease caused by a minute parasite, the *Acarus scabiei,* which resembles the cheese-mite in appearance. The female acarus burrows in the skin, particularly that on the back of the hand, forming small tunnels in which she lays her eggs, while the male wanders on the surface. The sides and legs may also be affected in the same way, though rarely the upper parts of the body. It is a popular mistake to imagine that only people of uncleanly habits contract the itch, for the mites may get upon the skin of any person.

Symptoms.—The person complains of great itchiness and heat, felt particularly soon after he goes to bed, and preventing sleep in the early part of the night. The spaces between the fingers, the backs of the hands, and the wrists are red and scabbed as the result of scratching, or the surface in these localities may even be much inflamed.

Treatment.—Take a hot bath and apply the following ointment over the body for four days:

℞ Sulphur Ointment .....one ounce
Lanoline .....one ounce
Vaseline .....one ounce
Mix.
DIRECTIONS: Use as directed, night and morning.

Repeat the bath; discard bedclothing and underclothing and thoroughly sterilize. This quickly destroys the parasite and cures the condition.

It must be remembered that sulphur ointment itself is irritating, and sometimes it sets up an eczema which so closely resembles the original condition that the treatment is persevered with long after the scabies is cured, the eczema getting only worse and worse. Stavesacre ointment and storax liniment are also used. Whatever remedy be employed, the gloves, underclothes, etc., must be baked or fumigated, otherwise the mites left in them may renew the itch.

ITCHING

This is an unpleasant condition of the skin surface which in some cases is so constant as to become unbearable.

Causes.—It is due to many different conditions, some of which are local and can be easily removed. Some are general, while occasionally the condition becomes so chronic and the skin so changed by scratching, etc., that it is incurable. Itching is produced by slight mechanical irritation, such as contact with rough woolen underclothing, also by parasites, such as lice, scabies (in the disease specially known as "the itch"), and these mechanical causes being removed the itching speedily vanishes. Various skin diseases, of which eczema is the chief, have itchiness as one of their main symptoms. In old age, when the skin is becoming thin and inelastic, itching sometimes becomes a troublesome complaint. In these and other conditions, a habit of scratching, which in course of time renders the skin rough and thickened, is apt to be contracted, and this of itself aggravates and keeps up the itchiness. Among the general diseases which

set up itchiness, the chief is diabetes. In fact, anyone who is much troubled by itchiness, especially if this be situated about the genital organs, should have his urine examined for the presence of sugar. Jaundice caused by various liver derangements, and Bright's disease, are often accompanied by itchiness in a milder degree. Dyspepsia is not uncommonly the cause of nettlerash, which may be of an itching type and appear soon after indigestible food has been taken. Some persons are much troubled by itching of the body when changes in size of the blood-vessels in the skin take place, as occur upon getting warm in bed or upon the advent of spring and autumn. A similar condition, which affects persons on going to the tropics, is known as prickly heat. A peculiar and often very aggravated form of itching occurs sometimes at the lower end of the bowel.

Treatment.—Warm baths, alkaline, or containing bran, are among the most soothing applications for general itching. It is essential that a proper examination should be made as to the functions of the internal organs in cases where itching is a chronic complaint. In diabetic cases, the surest remedy to prevent the itching due to incrustation of sugar is to wash frequently with plain water the parts which are most apt to be wet by urine or by perspiration. In addition to this washing, occasional sponging with Goulard's water gives temporary relief. Other useful and simple local applications are:

℞ Carbolic Acid Solution, 3 per cent. four fluid ounces
DIRECTIONS: Sponge on affected parts frequently.

Or:

℞ Menthol .....one dram
Olive Oil .....one fluid ounce
DIRECTIONS: Sponge on affected parts frequently.

Or:

℞ Boracic Acid Solution .....four fluid ounces
DIRECTIONS: Sponge on affected parts frequently.

LUPUS

Definition.—Lupus is a term used to designate a group of skin diseases of destructive and intractable character.

Varieties.—There are two chief types of the disease: *Lupus vulgaris*, which is certainly due to the tubercle bacillus; and

Lupus erythematosus, which some authorities consider also to be of a tubercular nature, though by most it is regarded as a type of inflammation by itself, which occurs in persons of feeble constitution or in those temporarily run down in health.

Lupus vulgaris begins most commonly shortly before the age of twenty, and not infrequently persists all through life, healing in one place to break out a short distance off. It causes great mutilation both on account of the widespread destruction of the features which it attacks, and of the unsightly scars it leaves behind. The nose, cheeks, brow, and sides of the neck are most frequently attacked, though the hands and the mucous membrane inside the nose and mouth are also common seats of the malady. The first sign of the disease is a small, soft nodule of yellowish transparent appearance, on this account often called an "apple-jelly" nodule. No pain or itching accompanies the disease, but the skin gradually becomes thickened and discolored, other nodules appear, and finally ulcers or small abscesses form. The disease progresses very slowly, but after it has been in existence some years the deformity produced may be very great. The nose may be partly or wholly eaten away, even the bones being absorbed, the lower eye-lids, if attacked, become drawn down, showing the red inner surface, and the skin, which is in places red and ulcerated, in places stretched and scarred, gives to the countenance a horrible appearance. The condition is of little infective power, and though the victims of lupus often die of consumption in the end, they may on the other hand pass through a long life without any other organ than the skin becoming affected by tuberculosis.

Lupus erythematosus consists of rounded red and slightly raised patches, which are distributed most commonly on the nose and cheeks. These patches, by fusing together at their edges, give a characteristic butterfly-like appearance to the reddened nose and cheeks. There is no tendency to the formation of ulcers, as in lupus vulgaris, and deformity in consequence does not result, though the patches of red alternating with white and atrophied skin render the complexion very unsightly.

Treatment.—In both cases attention to the general health is of the utmost importance, both because this has a considerable influence upon the progress of the skin eruption, and still more because the presence of either of these diseases indicates a weak

constitution and consumptive tendency. In the case of lupus erythematosus, this general treatment, combined with the local application of astringents, such as powdered zinc oxide or calamine, and the avoidance of coarse soap and other sources of irritation, is sufficient either to cure the disease completely, or, at all events, to render the complexion much more natural.

In the more serious condition of lupus vulgaris, early cases are treated by destruction of the nodules by the cautery, by caustics, or, best of all, by complete removal of the affected piece of skin. When the condition has spread widely, the disease may be checked by various strong ointments, plasters, and caustics, but the deformity produced by scarring admits of little amelioration.

The following ointment has proved successful:

℞ Ichthyol Ointment, 20 per cent. .....four ounces
DIRECTIONS: Apply night and morning.

Recently, however, the methods of treatment by concentrated light from an electric arc-lamp, by exposure to the X-rays, and by radium, have proved so successful in many cases to which they have been applied that the terrible disfigurement to which the disease used to give rise is now much less frequently seen.

PERSPIRATION—SWEAT

Definition.—Perspiration, or sweat, is an excretion from the skin, produced by microscopic sweat-glands scattered over the surface. Perspiration takes place constantly by evaporation from the openings of the sweat-glands, and this "insensible perspiration" amounts in twenty-four hours to considerably over a pint. Under certain circumstances, as when the skin is heated or the person exerts himself, drops of "sensible perspiration" appear on the skin; to these the term "sweat" is generally confined, and the amount of sweat secreted may become very large.

Sweat is a faintly acid, watery fluid, containing less than two per cent. of solids, made up mainly of salts, to a slight extent of fatty material and including a small amount of urea (about 1 part to 1000), the substance which the kidneys excrete in large amount.

The sweat-glands in man are situated in greatest numbers on

the soles of the feet and palms of the hands, and with a magnifying-glass their minute openings or pores can be seen in rows occupying the summit of each ridge in the skin. Perspiration is most abundant in these regions, though it also occurs all over the body. Different animals perspire in different regions; thus rabbits and rats do not sweat at all, oxen very little, pigs mostly on the snout, dogs and cats chiefly from the pads of the feet.

The chief object of perspiration is to regulate the amount of heat lost from the surface of the body and so maintain an even body-temperature. Accordingly muscular activity which sets free a great deal of heat is the chief cause of sweating, and external heat is another. The process is regulated by nerves some of which are the nerves controlling the size of the blood-vessels (vasomotor), and therefore the amount of blood in a part, while other nerves proceed to the sweat-glands (secretory) and directly influence secretion. These are presided over by centers in the spinal cord and medulla.

Abnormalities of Perspiration.—*Lessened* sweating under certain conditions may occur, as in the early stages of fever, in diabetes, and in some forms of Bright's disease. There are certain persons peculiar in the fact of being unable to sweat copiously after muscular exertion, or when exposed to heat, and such persons are often seriously affected by exposure to a hot sun or to the heat of an engine-room.

Excessive sweating may also take place in rheumatic fever, in the later stages of various other fevers, and above all in advanced consumption, where the night-sweats are often copious enough to drench the patient's night-clothes and bedding. In a slighter degree, persons of feeble muscular power are apt to perspire very freely upon exertion or when exposed to heat. Rickets is another disease in which children perspire copiously when asleep, and is peculiar in this fact that the sweating is mainly about the head. Some persons have the peculiarity of sweating copiously over a localized area, as, for example, one side of the forehead, and this peculiarity is generally due to some nervous injury.

Offensive perspiration is not uncommon. In rheumatic conditions the sweat has a peculiar, sour smell. Dyspeptics too are frequently troubled by an unpleasant odor of the skin. But it

is sweating of the feet or armpits that is most offensive of all, this condition being often due to decomposition of the skin secretions by bacteria.

Colored perspiration is a rare peculiarity, the sweat being tinged blue by indigo, or red by altered blood pigment.

Treatment.—*Lessened* perspiration is treated when necessary by various drugs known as diaphoretics.

Excessive sweating is diminished by the proper treatment of the disease which causes it. In consumption, the night-sweats are accompanied by a feeling of great weakness, and the clammy garments are a source of great discomfort to the patient till they are removed. Sweating is checked to some extent by sponging the skin with vinegar and water, and by the administration of astringent drugs. Belladonna is a drug which has special power in checking the secretion of sweat, either applied to the skin as the liniment of belladonna or more effectively when the extract or other preparation is given by the mouth.

℞ Extract of Belladonna ..... one-fifth grain tablets
Dose: One tablet every four hours.

Both the weakness and the cold sweats of phthisical patients are, however, mainly due to exhaustion of the nervous system, so that stimulating food, such as a bowl of beef tea at night, or stimulating drugs, such as strychnine, have perhaps the greatest power in diminishing both exhaustion and sweating in the early morning.

℞ Nitrate of Strychnine Sulphate ... 1/60 grain tablets
Dose: One tablet after meals.

Offensive perspiration can often be treated by frequent bathing and attention to the digestion. Sometimes, however, the unpleasant smell can be banished only by prolonged treatment. The feet, armpits, and other sources of perspiration should be washed daily with carbolic, coal-tar, or other mildly antiseptic soap, and thereafter dusted with boric acid powder. The stockings must be frequently changed, and, in addition to washing, they should be disinfected by being wrung out of boric lotion or weak perchloride of mercury lotion immediately before drying.

The shoes must also be treated by wiping them out with perchloride of mercury lotion now and then, because the bacteria responsible for the condition may survive on the damp leather.

PRICKLY HEAT—MILIARIA

Definition.—Prickly heat consists in the appearance of numbers of minute vesicles, produced by blocking of the outlet of the sweat or sebaceous glands in the skin, and accompanied by intolerable itching.

Causes.—It is due probably to the cells on the surface of the skin becoming sodden by the constant perspiration, and so swelling and blocking the outlets of the minute gland-ducts. Anything that leads to perspiration, such as hot drinks, hot soup, close rooms, or warm clothing, aggravates the condition.

Symptoms.—The surface is covered by minute vesicles which cause extreme itchiness and pricking. The scratching which this entails often leads to the formation of boils and pustules, but the condition is not in itself a dangerous one. The extreme discomfort, and the loss of sleep arising from it, may, however, be a serious matter for invalids.

Treatment.—The most important point is to avoid, so far as possible, all causes of perspiration, such as warm drinks, rough underclothing, and violent exercise. Common soap should not be used in the bath, and each time after bathing the skin should be dusted with an astringent and antiseptic dusting powder, such as one composed of boric acid, zinc oxide, and starch in equal parts.

As a preventive, rubbing the body over after the bath with the juice of a lemon has been recommended, while, as a cure, painting the patches with iodine solution or with corrosive sublimate lotion (1 to 1000) has been advocated. Calamine lotion or carbolic acid lotion relieves the itching temporarily.

℞ Boracic Acid .....one teaspoonful
Zinc Oxide .....one teaspoonful
Zinc Stearate .....one teaspoonful
Starch .....one teaspoonful
Mix.
Directions: Dust on affected parts.

PSORIASIS

Definition.—This is a disease of the skin in which raised, rough, reddened areas appear, covered with fine silvery scales. This eruption consists of a chronic inflammatory process in the true skin, the papillæ of which become considerably lengthened and more vascular than usual, together with changes in the cuticle which cause a defect in the horny formation that naturally takes place on the surface.

Causes.—The condition generally appears for the first time in childhood or youth, afterward disappearing and reappearing from time to time. It is very often a family disease occurring in different generations of one stock, and is often associated with gout or rheumatism. In some persons, psoriasis appears repeatedly at a particular season of the year, especially in the winter-time, but it does not seem to be infectious. Depressing influences seem to have something to do with its appearance, and people who are liable to attacks of this skin disease are troubled by its reappearance at any time when the general health is below par.

Symptoms.—The eruption almost always appears first round the back of the elbows and front of the knees. It begins as small pimples, each covered with a white cap of scales, which enlarge in breadth till they form patches two or three inches wide. At the same time, patches appear on other parts of the body, the scalp and face especially. The disease is divided into several varieties according to the size, shape, and distribution of these patches.

Treatment.—It is essential first of all to attend to the general health and relieve especially any constitutional condition, such as gout or rheumatism, by the appropriate remedies. The two chief remedies which are given internally for psoriasis are arsenic and thyroid extract, while tar ointment, chrysarobin ointment, turpentine, and ammoniated mercury ointment are among the chief and most successful external applications. Generally the eruption disappears after some weeks of careful treatment, but occasionally cases of this skin disease are met with which seem to benefit but little from even the most careful handling.

For internal use, the following is beneficial:

℞ Fowler's Solution .....one fluid dram
Cod-liver Oil .....four fluid ounces
Syrup Iodide of Iron .....one fluid dram
Acacia .....one ounce
Water, enough to make .....eight fluid ounces
Mix and make into an emulsion.
Dose: One teaspoonful after meals, followed by a glass of water.

The following ointment is also largely used:

℞ Oil of Cade .....one-half dram
Chrysarobin .....twenty grains
Zinc Oxide Ointment .....one ounce
Mix and make an ointment.
Directions: Apply locally to affected parts.

RINGWORM

Definition.—Ringworm is a vague popular name which includes various diseases of the surface of the skin, caused by vegetable parasites of the nature of molds. The technical name for ringworm is "tinea," and this term includes *Tinea favosa*, also known as favus and honeycomb ringworm; *Tinea sycosis*, or pustular ringworm of the beard; *Tinea versicolor*, or pityriasis, which produces brown patches on the skin, as well as *Tinea tonsurans*, the general name applied to ringworm affecting the scalp; and *Tinea circinata*, which is the same disease as it affects the skin of the body and limbs.

There are many other forms of ringworm affecting cattle, dogs, cats, birds, etc., and these are occasionally conveyed to persons handling the animals, while special types of ringworm are found in different parts of the world.

These diseases are closely allied also to the more serious conditions actinomycosis and Madura-foot, in which the special fungus causing them penetrates to parts beneath the skin.

Causes.—As already stated, the cause in every case is a vegetable parasite that penetrates among the superficial cells of the cuticle and down the follicles of the hairs. The particular

parasite causing ringworm of the scalp is, in the great majority of cases, either the *Microsporon Audouini* or *Trichophyton megalosporon*, while ringworm of the body or limbs is generally due to the latter. Favus is due to the *Achorion Schoenleinii*, while Tinea versicolor is due to a parasite known as *Microsporon furfur*. All forms are contagious, some much more so than others. Peculiarities of the individual skin have much to do with the contagion; for example, persons with fine, fair hair suffer notably in greater numbers from ringworm of the scalp than do dark-haired people. Though persons of all ages contract spots of ringworm on the body, especially from handling animals, and on the face, yet ringworm on the scalp is almost entirely confined to children below the age of fourteen. The medium of infection may be the cap of another child suffering from ringworm, or brushes and combs used by affected persons. Ringworm of the beard (sycosis) is generally attributed to a "foul shave," the infection having probably been conveyed on a barber's soap or brush from another person similarly affected.

Symptoms.—Very often children who get ringworm are of a weak constitution, but, apart from this, ringworm has little or no effect upon the general health. The disease consists of a disorder in the cuticle and hairs, with more or less inflammation in the underlying true skin. *On the body*, it begins as a small red pimple, which spreads out into rounded patches with raised, red, scaly margin, the skin looking more natural in the center of each patch, where the disease has partly subsided. The patches are either in rings or spread in a serpentine course, this appearance having given the disease its name. *On the head* one sees merely scaly patches covered by the stumps of broken hairs; and if a hair be pulled out and examined under the microscope it is found to be surrounded by masses of the parasite or split up by its growth throughout the hair. Ringworm of the beard (sycosis) is apt to show great irritation, and each affected hair is surrounded by a small collection of pus. Ringworm of the head occasionally becomes pustular and inflamed, and, although this condition is a very disgusting-looking one, it generally brings about a natural cure. Favus is also a pustular condition, each hair being surrounded by pus which, on the surface, dries into a yellow crust, and neighboring crusts, being flattened by mutual contact, give the head its characteristic "honeycomb"

appearance. Even the nails may be affected by ringworm, and they then assume a discolored, thickened, brittle condition.

Treatment.—Ringworm on the body and limbs is almost always very easily got rid of; on the face it is harder to cure; while on the head, in children, it may run a course of months or years even under the most skilful treatment.

When on the body, it seldom fails to disappear speedily if painted night and morning with a mixture of liniment and tincture of iodine in equal parts. This has not only a destructive action upon the parasite, but it splits up the surface of the skin and gives the iodine free access to it.

Ringworm of the scalp in children is more difficult to treat. The hair must be cut as short as possible all round the patches, and thoroughly washed with soap at frequent intervals to remove all scales. Strong antiseptics are also rubbed in as ointments or spread on as liniments or paints, as:

℞ Sodium Biboratis .....one dram
Water .....two fluid ounces
Mix.
Directions: Apply with a soft cloth.

Or:

℞ Iodine .....two drams
Lanoline (Hydrolated) .....two ounces
Mix.
Directions: Apply every day.

Some of the most commonly used substances are perchloride of mercury, sulphur, carbolic acid, iodine, salicylic acid, chrysarobin, and formalin. Another mode of treatment, which is often successful, consists in painting the patch with croton oil. This causes a certain degree of inflammation down the hair follicles, the affected hairs drop out, and cure results. Depilation of the hairs is often tried, but this is a tedious process, and since the hairs are brittle they tend to break instead of coming out entirely, so that no benefit results. The application of the X-rays for a sufficient time just to make the hair fall out, very often effects a cure, and the hair should grow again after recovery.

In ringworm of the beard, the treatment is much the same as for the scalp condition. The hair may be either shaved or closely

cut, and an antiseptic ointment rubbed in. A highly successful method of treatment, which is also quite painless, consists in pulling out several of the affected hairs daily, and pushing a carefully sharpened splinter of wood, which has been dipped in pure carbolic acid, down to the bottom of each empty follicle.

Great precautions must be taken not to infect others. Children with ringworm of the scalp must not wear the caps of other children, nor go to school, nor to a barber. Persons with ringworm of the beard must not use shaving instruments employed by other people.

SCALD-HEAD—TINEA CAPITIS

Definition.—This disease consists in a chronic inflammation of the skin of the head, productive of a secretion of matter peculiar in its nature, and capable of propagating the complaint if applied to the head of a healthy subject. At first the eruption is confined to only a small portion of the head, but by degrees its acrimony is extended to the neighboring parts, and at length the whole of the scalp is eroded and covered with a scabby eruption.

Children principally are affected with it. It may arise from uncleanliness, the want of a due proportion of wholesome nutritive food, and possibly from bad nursing. At any rate, these will very much aggravate the disease. In many instances it is propagated by contagion.

Treatment.—Cleanliness is of the greatest importance in this disease. The hair should be cut as short as possible, and during the course of the disease all unhealthy hairs should be pulled out with a pair of small forceps, or tweezers. The diet should be carefully regulated, avoiding all stimulating and rich food.

Remove the crusts with a simple poultice, as bread and milk, or a wash of two or three drams of subcarbonate of potassa to a pint of water. After this, apply night and morning ointment of the nitrate of mercury, or ointment of the iodide of potassium, in the proportion of one dram of the potassium to two ounces of lard. Wash the parts well with Castile soap and tepid water before applying the ointment. When there is much discharge, apply two or three times a day a solution of two or three grains of sulphate of zinc to an ounce of water; if there is no discharge,

an ointment composed of one dram of powdered sulphate of zinc to an ounce of lard, or a lotion of two drams of bicarbonate of potash to a pint of water. If these fail, try two drams of the sulphate of potash, two drams of white soap, and half a pint of lime-water. If any of these applications produce an irritation, they must be discontinued, and poultices and tepid washes used. An ointment well recommended is as follows:

℞ Pulverized Sulphate of Copper .....ten grains
Extract of Spanish Flies .....five grains
Lard .....one ounce
Mix.

Directions: Use once a day, after thoroughly washing with Castile soap and water.

Sometimes the following ointment will produce excellent results:

℞ Acid Nitrate of Mercury ..... one dram
Water .....four ounces
Mix.

Directions: Apply with a camel's-hair brush every other day.

SCROFULA—STRUMA

Definition.—This disease is a state of constitutional weakness, generally exhibiting itself in early life, and characterized mainly by defective nutrition of the tissues, which renders them a ready prey to tuberculosis. The condition is also known as the tubercular constitution. The condition, as it manifests itself in disease of the glands in the neck, was formerly known in England as "king's evil," from the belief that the touch of the sovereign could effect a cure. This superstition can be traced back to the time of Edward the Confessor in England, and to a much earlier period in France. Samuel Johnson was touched by Queen Anne in 1712, and the same prerogative of royalty was exercised by Prince Charles Edward in 1745.

The following will increase nutrition:

℞ Cod-liver Oil .....one pint
Directions: One tablespoonful after meals.

Or:

℞ Emulsion of Cod-liver Oil and Malt .....one pint
Directions: Two teaspoonfuls after meals.

SCURVY—SCORBUTUS

Definition.—Scurvy is a morbid condition of the blood, manifesting itself by marked impairment of the nutritive functions and by the occurrence of extravasations of blood in the tissues of the body, and depending on the absence of certain essential ingredients in the food. There is also a tendency to a spongy state of the gums.

Causes.—In former times this disease was extremely common among sailors, and gave rise to a frightful amount of mortality. It is now, however, of rare occurrence at sea, its cause being well understood and its prevention readily secured by simple measures. Scurvy has also frequently broken out among soldiers on campaign, in beleaguered cities, as well as among communities in times of scarcity, and in prisons, workhouses, and other public institutions. In all such instances it has been found to depend closely upon the character and amount of the food. It has been supposed that a diet too limited, either in amount or variety, might induce the disease; but an overwhelming weight of evidence goes to prove that the cause resides in the inadequate supply or the entire want of fresh vegetable matter. The manner in which this produces scurvy is not quite clear. Some high authorities have held that the insufficient supply of potash salts, in which vegetables are rich, is the procuring cause; but it has been found that the mere administration of these salts will neither prevent nor cure scurvy. Hence, while it is probable that this may be one of the factors concerned in the production of the disease, the want of other vegetable constituents, especially vegetable acids, is of still greater importance. Besides this essential defect, a diminution in the total amount of food, the large use of salted meat or fish, and all causes of a depressing kind, such as exposure, anxiety, bad hygiene, etc., will powerfully contribute to the development of the disease.

Infants too may suffer from scurvy as the result of improper feeding and unhealthy surroundings.

Symptoms.—The symptoms of scurvy come on gradually, and its onset is not marked by any special indications beyond a certain failure of strength, most manifest on making effort. Breathlessness and exhaustion are thus easily induced, and there exists

a corresponding mental depression. The countenance acquires a sallow or dusky hue; the eyes are sunken; while pains in the muscles of the body and limbs are constantly present. The appetite and digestion may be unimpaired in the earlier stages, and the tongue comparatively clean, but the gums are tender and the breath offensive almost from the first. These preliminary symptoms may continue for weeks, and in isolated cases may readily escape notice, but can scarcely fail to attract attention where they affect large numbers of men. In the further stages of the disease, all these phenomena are aggravated in a high degree, and the physical and mental prostration soon becomes extreme. The face looks haggard; the gums are livid, spongy, ulcerating, and bleeding; the teeth are loosened and drop out; and the breath is excessively fetid. Extravasations of blood now take place in the skin and other textures. These may be small, like the petechial spots of purpura, but are often of large amount, and cause swellings of the muscles in which they occur, having the appearance of extensive bruises, and tending to become hard and brawny. These extravasations are most common in the muscles of the lower extremities; but they may be formed anywhere, and may easily be produced by very slight pressure upon the skin or by injuries to it. In addition, there are bleedings from mucous membranes, such as those of the nose, eyes, and alimentary or respiratory tracts, while effusions of blood-stained fluid take place into the pleural, pericardial, or peritoneal cavities. Painful, extensive, and destructive ulcers are also apt to break out on the limbs. Peculiar disorders of vision have been noticed, particularly night-blindness (nyctalopia), but they are not invariably present, nor specially characteristic of the disease. The further progress of the malady is marked by profound exhaustion, with a tendency to fainting, and with various complications, such as diarrhea and lung or kidney troubles, any or all of which may bring about a fatal result. On the other hand, even in desperate cases, recovery may be hopefully anticipated when the appropriate remedy can be obtained. The composition of the blood is materially altered in scurvy, particularly as regards its albumin and red corpuscles, which are lessened while the fibrine is increased.

Treatment.—No disease is more amenable to treatment, both as regards prevention and cure, than scurvy, the single remedy

of fresh vegetables or some equivalent securing both these ends. Potatoes, cabbages, onions, carrots, turnips, etc., and most fresh fruits, will be found of the greatest service for this purpose. Lime juice and lemon juice are recognized as equally efficacious, and even vinegar in the absence of these will be of some assistance. The plain vegetable acids (citric and tartaric) have also been used with good results. The ulcers of the gums and limbs can be best treated by stimulating astringent applications; the hard swellings, which are apt to continue long, may be alleviated by fomentations and massage; while the anemia and debility are best overcome by the continued administration of iron tonics, aided by fresh air and other measures calculated to promote the general health.

℞ Hydrochloric Acid .....one fluid dram
Honey .....one fluid ounce
Rose-water .....one fluid ounce
Mix.
Directions: Apply to affected gums three or four times a day.

Or:

℞ Potassium Chlorate .....one-half dram
Listerine .....one fluid dram
Citric Acid .....six grains
Water .....two fluid ounces
Mix.
Directions: Use several times a day as a mouth-wash.

The following iron tonic has proved most effective:

℞ Reduced Iron .....thirty grains
Sugar of Milk .....one dram
Alcohol, enough to make .....fifty tablets.
Directions: One tablet after meals.

SUNBURN

Sunburn includes the various effects produced upon the skin by the sun's rays. Similar effects are produced by exposure to the heat of furnaces, and also on the skin of those who are exposed for long periods close to electric arc-lamps or X-ray apparatus.

The effect produced on the skin is attributed by some entirely to heat, by others to the chemically active rays at the higher end of the spectrum. The actual changes vary greatly in different individuals, fair-haired, delicate, thin-skinned people suffering to a much greater extent, as a rule, than the strong and swarthy.

Symptoms.—In its simplest form sunburn consists in the development of dark pigment in the deeper layer of the epithelium, which gives the skin a brown hue and acts as a natural protection from the heat rays. In a severer form, there are marked flushing of the skin (erythema), tingling, itching, and finally peeling off of the cuticle in flakes. This process may be very severe, painful, and accompanied by the formation of blisters. After long periods of sunburn, the skin is apt to become permanently dry and wrinkled as well as browned.

Treatment.—Mere tanning of the skin under the sun's rays is a healthy sign which requires no treatment, but the severer forms are not only unsightly but often very painful. Prevention may be effected by the use of sunshades, veils, etc., those of a brown color being most effective. The redness may be relieved by dabbing on an evaporating fluid such as eau de Cologne, elder-flower water, or rose-water. The effects of heat may also be to some extent prevented by sponging the exposed parts with an astringent, or by applying cold cream before exposure to the sun. After the burn has been received, relief is obtained by the following, which is most efficacious:

℞ Carron Oil .....four fluid ounces
Directions: Keep parts well saturated and wrapped in gauze.

SUNSTROKE

Sunstroke, heat-stroke, insolation, coup de soleil, and thermic fever are terms applied to the effects produced upon the central nervous system, and through it upon other organs of the body, by exposure to the sun or to overheated air. Although most frequently observed in tropical regions, this disease occurs also in temperate climates during hot weather. A moist condition of the atmosphere, which interferes with cooling of the overheated body, greatly increases the liability to suffer from this ailment.

Symptoms.—The symptoms of heat-stroke, which obviously depend upon the disorganization of the normal heat-regulating mechanism, as well as of the functions of circulation and respiration, vary in their intensity and likewise to some extent in their form. Three chief types of the disease are described:

(1) *Heat Syncope.*—In this form the symptoms are those of exhaustion, with a tendency toward fainting or its actual occurrence. A fully developed attack of this description is usually preceded by sickness, giddiness, some amount of mental excitement followed by drowsiness, and then the passage into the fainting condition, in which there are pallor and coldness of the skin, a weak, quick, and intermittent pulse, and gasping or sighing respiration. Death may quickly occur; but, if timely treatment is available, recovery may take place.

(2) *Heat Apoplexy* or *Asphyxia.*—In this variety the attack, whether preceded or not by the premonitory symptoms already mentioned, is usually sudden, and occurs like an apoplectic seizure. There is usually insensibility, and convulsions are frequent. Death is often very sudden. This form, however, is also amenable to treatment.

(3) *Ardent Thermic Fever.*—This variety is characterized chiefly by the excessive development of fever (hyperpyrexia), the temperature of the body rising at such times to from 108° to 110° F. or more. Accompanying this are the other symptoms of high febrile disturbance, such as great thirst, quick full pulse, pains throughout the body, headache, nausea, and vomiting, together with respiratory embarrassment. After the attack has lasted for a variable period, often one or two days, death may ensue from collapse or from the case assuming the apoplectic form already described. But here, too, treatment may be successful if it is promptly applied.

Besides these, other varieties depending on the prominence of certain symptoms are occasionally met with. The chief changes in the body after death from heat-stroke are those of anemia of the brain and congestion of the lungs, together with softness of the heart and of the muscular tissues generally. The blood is dark and fluid and the blood-corpuscles are somewhat altered in shape. Attacks of sunstroke are apt to leave traces of their effects upon the constitution, especially upon the nervous system. A liability to severe headache, which in many cases would seem

to depend upon a condition of chronic meningitis, epileptic fits, mental irritability, and alterations in the disposition are among the more important. It is often observed that heat in any form is ever afterward ill borne, while there also appears to be an abnormal susceptibility to the action of stimulants. The mortality from sunstroke is estimated at from forty to fifty per cent.

Treatment.—In respect of this disease, means should be adopted to prevent attacks in the case of those who must necessarily be exposed to the sun. These consist in the wearing of loose clothing, and of a suitable helmet with protection to the neck and back, in due attention to the function of the skin, and in the avoidance of alcoholic and other excesses. Cold water may be drunk in small quantities at frequent intervals. Sleeping in the open air in very hot seasons is recommended. The treatment of a patient suffering from an attack necessarily depends upon the form it has assumed. In all cases he should if possible be at once removed into a shaded or cool place. Where the symptoms are mostly those of syncope and there is a tendency to death from heart failure, rest in the recumbent position, the use of diffusible stimulants, such as aromatic spirits of ammonia or ether, with friction applied to the extremities, are the means to be adopted. Where, on the other hand, the symptoms are those of apoplexy or of hyperpyrexia, by far the most successful results are obtained by the use of cold (by pumping cold water over the head, neck, and back, the cold affusion, rubbing the surface with ice, or enemata of ice-cold water). The effect is a marked lowering of the temperature, while at the same time a stimulus is given to the respiratory function. Should the temperature be lowered in this way but unconsciousness still persist, removal of the hair and blistering a portion of the scalp are recommended. Subsequent treatment depends upon the nature of the resulting symptoms, but change to a cool climate often shows marked benefit, in cases which show chronic effects of the sunstroke.

SYCOSIS—BARBER'S ITCH

Definition.—Sycosis is a condition in which pustules form in the hair follicles of the beard region.

Causes.—It is often attributed to a dirty shave, or infection from a barber's brush or razor. Whether this be the case or not,

the condition is a very obstinate one to cure, and one which shows no natural inclination to disappear of its own accord. The mustache is less commonly affected than the chin and cheeks. Shaving is often very difficult, and short clipping has often to be resorted to.

Treatment.—Antiseptic ointments, X-rays, and other forms of treatment have been tried, and any one of these may be successful, but the use of a vaccine prepared from the organisms, which can always be cultivated artificially from the discharge, gives probably the best results. Somewhat prolonged treatment, however, is generally necessary, and the sooner a person affected with this complaint gets it attended to, the better. Sometimes there is considerable difficulty in distinguishing between this affection and ringworm of the beard; even experts at times have difficulty in deciding.

All hairs must be shaved off, which may be done by first greasing the skin with white vaseline and then shaving. The skin should then be washed with a warm solution of boric acid. Dry well by dabbing the moisture from the skin and not by rubbing. Then apply the following:

℞ Sulphur Ointment .....one ounce
Boracic Acid .....one ounce
Mix.
Directions: Apply twice a day.

The above treatment must be carried out daily and persistently, leaving the above ointment on the face at all times.

URTICARIA—HIVES—NETTLE RASH

Definition.—Urticaria, also known as hives and nettle rash, is a disorder of the skin characterized by an eruption resembling the effect produced by the sting of a nettle, namely, raised red or red and white patches occurring in parts or over the whole of the surface of the body, and attended with great itching and irritation. It may be acute or chronic.

Causes.—In the acute variety the attack appears to be connected with digestive derangements and often comes on after indulgence in certain articles of diet, particularly various kinds

of fruit, shell-fish, cheese, pastry, etc., also occasionally from the use of certain drugs, such as henbane, copaiba, cubebs, turpentine, etc. The chronic variety consists of an eruption similar to that above described, but lasting with interruptions for a length of time, often extending to months or years. This form of the disease occurs independently of errors in diet, and is not attended with the feverish symptoms characterizing the acute attack. It is probably connected with constitutional conditions, and is occasionally observed in the gouty.

Symptoms.—There is at first considerable feverishness and constitutional disturbance, together with sickness and faintness, which either precede or accompany the appearance of the rash. The eruption may appear on any part of the body, but is most common on the face and trunk. In the former position, it causes swelling and disfigurement while it lasts, and is apt to excite alarm in persons unacquainted with its nature. The attack may pass off in a few hours, or may last for several days, the eruption continuing to come out in successive patches.

Treatment.—The acute variety generally yields quickly to a purgative and the use of some antacid, such as magnesia, or bicarbonate of soda. The local irritation is allayed by sponging with a warm alkaline solution (a teaspoonful of soda to a tumblerful of warm water).

℞ Goulard's Water .....four fluid ounces
Directions: Apply locally.

Or:

℞ Carbolic Acid .....one fluid dram
Glycerine .....one-half fluid dram
Alcohol .....one fluid ounce
Water .....seven fluid ounces
Mix.
Directions: Apply locally.

Internally, the following is most useful:

℞ Acetanilid .....forty grains
Salophen .....one dram
Potassium Bitartrate .....one and one-half drams
Mix, and divide into twelve powders.
Directions: One powder every four hours.

Or:

℞ Calcium Chloride ..... ten-grain tablets
Dose: One tablet three times a day.

As an external application use one of the following:

℞ Sugar of Lead .....one-half dram
Carbonate of Ammonia .....one dram
Rose-water .....one-half pint
Mix.

Or:

℞ Corrosive Sublimate .....three grains
Spirits of Rosemary .....one-half ounce
Alcohol .....one-half ounce
Emulsion of Bitter Almonds .....three ounces
Mix. Apply with soft cloth to the skin.

It is advisable to make use of external applications carefully, or the eruption may be driven in and serious consequences follow.

VERRUCA—WARTS

Definition.—Warts are small, solid growths arising from the surface of the skin. They are of interest from the fact that they stand somewhere between mere thickenings of the skin due to irritation, and tumors. They are, as a rule, harmless, and are objectionable only as blemishes, and not on account of any ill effects they occasion. Sometimes, however, pigmented warts, and warts that have been exposed to much irritation, in old people develop into malignant growths.

Varieties and Causes.—*Common warts* develop on the skin of children and young persons in positions where the growth of the skin is exuberant and the surface is exposed to much irritation, for example on the knuckles, on the backs of the hands, and on the face. Occasionally such warts come out in a crop when the person is reduced in health. In structure, these warts consist of a bundle of fibers produced by overgrowth of the papillæ in the true skin, each bundle enveloped by a cap of the horny cells that cover the surface of the cuticle, and the whole mass being surrounded by a ring of thickened cuticle. These fibers can easily be seen when the surface of the wart becomes

worn away, and especially if the top of the wart be accidentally cut or knocked off, so that it bleeds. The dirty-brown color of warts is due to dirt becoming lodged between these fibers. *Senile warts* are usually hard, wrinkled, and slightly raised areas of skin found in old people. *Soft warts*, consisting of little tags of skin, are found especially upon the neck, chest, ears, or eyelids of persons whose skin has been subjected for long to some irritation, such as that of working among paraffine. *Horns* are formed sometimes upon the face or hands, as the result of the drying up of the sebaceous material exuding from the skin that covers a wart, and, as the secretion goes on, these horns occasionally reach a length of some inches. *Tubercular warts* are developed sometimes as the result of a wound in the skin of the hands, especially of those who have come in contact with persons suffering from some form of tuberculosis.

Treatment.—As a rule, warts are removed painlessly by the application of some substance which dissolves the horny surface and cauterizes the parts beneath. Caustic potash, nitric acid, or lunar caustic is used for this purpose, but care must be taken that the drop applied to a wart does not run over the neighboring skin. Several applications, as a rule, are necessary to each wart. Warts that hang by a pedicle and the warts of old people are best removed by snipping off with scissors, the bleeding being easily checked by some astringent. Tubercular warts should be completely excised. When warts come in a crop, as they sometimes do, tonic remedies will generally effect their disappearance.

Ordinary warts are removed by cutting or by burning them off with a silver nitrate pencil, or by electrolysis.

The application of glacial acetic acid with a camel's hair brush is the recognized method.

WENS

Definition.—Wens are small cystic tumors in the skin, consisting of a collection of sebaceous material, due to blockage of the outlet from a sebaceous gland. They occur most commonly about the face and scalp, where they form smooth, rounded, elastic tumors often of considerable size; but give rise to no trouble save that occasioned by their position, by their unsightliness,

and by the fact that they are liable to become inflamed from the pressure of the hat, etc.

Treatment consists in opening the cyst, squeezing out its fatty contents, and carefully removing the lining membrane. If any part of the membrane lining the interior be left behind, the wound heals in such a way that the wen is apt to refill. On the scalp this membrane is tough and can generally be pulled out entire, but on the face greater care is necessary, and the thin skin over the wen, to which the lining membrane is adherent, is also removed. The little operation is usually performed under cocaine or without any anesthetic and is accompanied by very little pain.

ANATOMY AND PHYSIOLOGY

THE CELL AND THE EMBRYO

THE human body is built up of a vast mass of minute cells, which are somewhat complex in structure. The substance of the cell body contains the chemical elements present in organic compounds. and the machinery for reproduction by division.

For the function of reproduction of the individual certain special cells are set aside in the body, the ova in the female and the spermatozoa in the male.

An ovum is a comparatively large spherical cell, about $\frac{1}{120}$ of an inch in diameter. It has two containing membranes, the outer of which is thick, and pierced by minute canals. The cell substance of the ovum, the *yolk,* contains a great number of nutritive granules.

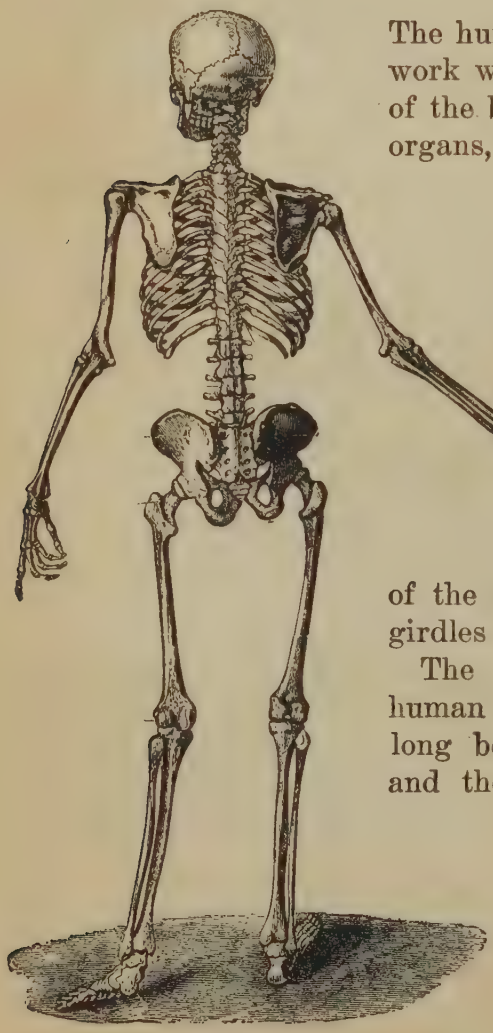
A spermatozoön is only a little more than a third of the size of an ovum in length, and is composed of a barbed, flat, oval head, a rounded body somewhat longer than the head, and a tapering tail six or eight times as long as the head, the power of movement of the cell being due to the lashing of the tail.

In the process of fertilization which must take place for the reproduction of a new individual, the spermatozoön meets the ovum, passes through one of the minute canals of the outer membrane, and penetrates the substance of the ovum with its head. The tail of the spermatozoön then disappears, and the head and body turn into a nucleus which blends with the nucleus of the ovum.

After a period the ovum commences to reproduce generations of cells, which mass together, flatten out, and begin to arrange themselves into three layers which severally develop into the different tissues and organs of the human body. One tiny fold forms into a groove which folds over and meets to form the

rudimentary brain and nervous system. The vertebral column and the membranes of the brain and spinal cord begin to develop. This same layer develops into the skeleton, the blood and blood-vessels, the urinary and reproductive systems, the fatty tissue, the marrow of bones, and the teeth, all but the enamel. The teeth enamel, skin, hair, nails, nervous system, membranes of the mouth and nose, and the lens of the eye come from another layer. And the third produces the lining of the alimentary canal, of the larynx and lungs, and the secreting cells of the liver, pancreas, thyroid, and thymus.

THE SKELETON



The Skeleton.

The human skeleton, the bony framework which supports the soft tissues of the body and protects the internal organs, may be considered under the subdivisions of the axial skeleton, comprising the skull (including the teeth) and the hyoid bone, the spinal column, the ribs, and the sternum, or breast-bone, and the appendicular skeleton, comprising the bones of the limbs together with the bony girdles which support them.

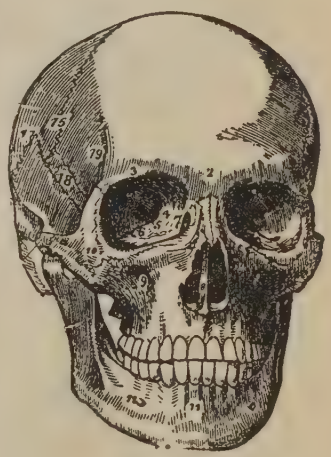
The bones which compose the human skeleton are of three types: long bones, such as the thigh-bone and the arm-bone; flat bones, such as the bones of the skull; and short or cubical bones, such as the small bones of the wrist and the vertebræ.

In long bones there

is a shaft of compact tissue, the shaft being hollow in the middle and containing a pulpy substance called the marrow, while each end of the bone is enlarged and rounded.

THE AXIAL SKELETON

The Skull.—The adult skull is composed of twenty-two bones, eight of which take part in the formation of the cranium, or brain box, and fourteen in the formation of the skeleton of the face. The bones are joined together by a sort of dovetailing arrangement of their uneven edges; but at birth there are six spaces between the bones, in at least one of which pulsations can be observed. In old age the joint tends to ossify, so that the skull becomes a shell.



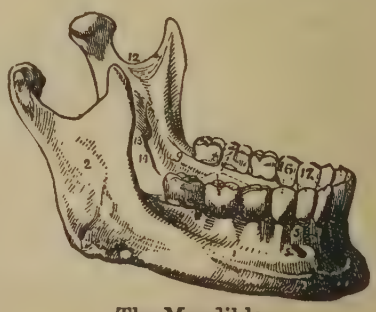
The Skull.

The frontal bone is a shell-shaped bone extending across the forehead, from one side of the skull to the other, forming also the upper parts of the orbits. The two parietal bones are quadrilateral and convex, forming the lateral walls of the cranial vault. The temporal bones are placed at each side of the skull in the region of the ear, composed of a thin, sharp-edged portion which forms part of the wall of the cranium, a hard portion which contains in its interior the internal ear and the outer part of which is the prominent mastoid process behind the ear, and a tympanic portion, circular and forming the walls of the external opening of the ear.

The occipital bone is fan-shaped, and is placed at the back and base of the skull, and through a large circular opening in its base the spinal cord and vertebral arteries pass. The sphenoid bone takes part in the formation of the base of the skull, being placed in front of the occipital; its prominent wings at each side form part of the cranial wall between the frontal and temporals, while other plate-like processes form part of the orbits and the nasal cavity. The ethmoid bone is composed of two spongy lateral masses joined to a central vertical plate, taking part in the formation of the walls of the nasal cavity.

The bones of the face surround the cavities of the nose and the mouth and take part, in conjunction with certain bones of the cranium, in the formation of the cavities of the orbits. The two nasal bones are little plate-like bones at the root of the nose between the nasal processes of the superior maxillæ. The two superior maxillary bones have a cubical body containing an air-sinus, with a prominent lower border in which the teeth of the upper jaw are set, a projection upward, the nasal process, which forms the side of the nose, a process inward to form the hard palate, and a smooth surface presented upward to form part of the floor of the orbit. The two malar bones, crossing from the superior maxillæ to the temporals, form the prominences of the cheeks and the outer parts of the orbits. The two lachrymal bones are little bones forming part of the inner walls of the orbits. The two inferior turbinated bones are thin spongy bones joining the lateral parts of the ethmoid and forming part of the outer walls of the nasal cavity. The vomer is a sharp-edged triangular bone dividing the posterior part of the nasal cavity in two. The two palate bones form the posterior part of the outer walls of the nasal cavity and the posterior part of the hard palate. The inferior maxillary bone, or mandible, is horseshoe-shaped, with prominent, flat, upturned ends, which articulate at each side with the temporal bones, forming a hinge-like joint, while the upper border of the front horizontal part or body of the bone is armed with the teeth of the lower jaw.

The Bones of the Face.



The Mandible.

A child has only twenty teeth, called the "milk teeth," which begin to appear at the age of six months and persist till about the age of seven years, when they begin to fall out and to be replaced by the permanent teeth.

An adult has thirty-two teeth, comprising, from before backward, in each half of each jaw, two incisors, one canine, two premolars, and three molars.

The Hyoid Bone.—The hyoid bone lies in the front of the neck between the mandible and the larynx, and is a horseshoe-shaped bone with a small body and arching wings, two prominences on the upper surface at the extremities of the body being called the lesser wings.

The Spinal Column.—The spinal or vertebral column is composed originally of thirty-three vertebræ, but in the adult the first twenty-four vertebræ remain separate, the next five join together to form the sacrum, which is part of the bony girdle of the pelvis, and the last four fuse more or less completely to form the coccyx, or cuckoo's bill. The upper seven separate vertebræ are termed the cervical; the next twelve, with which the ribs articulate, the dorsal; and the lower five, the lumbar. The spine, as a whole, presents two curves.

The vertebræ possess a cylindrical body which is united by disks of cartilage to the bodies of the vertebræ immediately above and below. From the body, on its outer side, are thrown off two bony projections which meet to form a canal for the spinal cord. The bone of the canal has three projections on its outer side, one in the center (the spinous process, whence comes the term spinal column), forming the spring ridge of the back-bone, and one on each side (transverse processes). Above and below the last named are other projections which interlock with those of the adjacent vertebræ.

Vertebræ.

The Spinal Column.

The Atlas.

The cervical vertebræ differ from the others by their transverse processes being pierced by a hole, while their bodies have an oblong shape and their spinal processes are split through the middle. The first cervical vertebra, or atlas, is in the form of a ring, the usual body being quite absent, and upon its large, rather horizontal facets the skull rests. The second cervical vertebra, or axis, has a pointed vertical prolongation of its body which passes through the ring of the atlas and is held in place by strong ligaments, acting as a pivot for many of the movements of the head.

The dorsal vertebræ have depressions on the sides of their bodies for joining with the heads of the ribs, and excepting the eleventh and twelfth, they have tiny hollows also on their transverse processes to support the ribs.

The lumbar vertebræ have large kidney-shaped bodies, spade-like spinous processes, and large and prominent jointing projections.

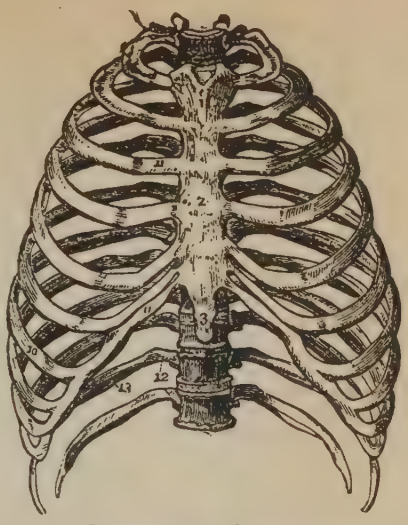
The sacrum, or collect bone, formed by the conjunction of five vertebræ, is of a somewhat triangular shape. The anterior surface is smooth and forms the posterior wall of the basin of the pelvis, while the posterior surface is rough. Through the four pairs of openings in its body, various nerve-trunks emerge.

The Sacrum.

The coccyx, formed by the fusion of four terminal vertebræ, is triangular in shape and articulates with the lower end of the sacrum.

The Ribs.—The ribs, twelve pairs in number, are flat, elastic bones, curved in the form of an arch, and compose a protecting framework for the chest. Each pair of ribs joins behind with one of the thoracic vertebræ. In front, the first seven pairs are connected by bars of cartilage, the costal cartilages, with the sternum, or breast-bone, and are called the true ribs; the lower five pairs are called the false ribs, the first three of them being at-

tached by bars or plates of cartilage to the ribs above, but not to the sternum, while the last two, or floating ribs, are free in front.



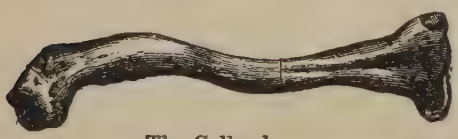
The Ribs and the Breast-bone.

A typical rib has a wedge-shaped head, articulating with a facet on the side of the body of a vertebra, behind which is a somewhat narrow neck; beyond the neck, projecting backward, is a tuberosity which articulates with the transverse process of its vertebra, while the curved shaft is thin and flat with sharp edges, bending sharply toward the back, at the angle. The first rib is shorter, wider, and flatter than the others, while the eleventh and twelfth ribs are short, with very slight curves and pointed ends.

The Breast-bone.—The sternum, or breast-bone, is placed in the middle of the upper part of the chest. It consists of three portions: the handle, the upper, flat, and somewhat square portion; the sword-blade, the middle, flat, and rather elongated portion; and the point, which is short and cartilaginous.

THE APPENDICULAR SKELETON

The upper limb may be divided into the shoulder, the upper arm, the forearm, and the hand. The skeleton of the shoulder comprises two bones, the collar-bone and the shoulder-blade.



The Collar-bone.

The collar-bone stretches from the shoulder-blade to the breast-bone, with both of which it forms joints; it has a curved shaft, and is thick and somewhat triangular in section at the inner and flattened at the outer end.

The shoulder-blade is a flat, triangular bone, with a prominent spine projecting right across its posterior aspect and ending in a broad process.

The humerus is the sole bone of the upper arm; it is a long bone with a rounded shaft, an upper extremity with a convex joint surface, and a flattened lower extremity with a partly grooved, partly rounded joint surface at its lowest part, a tuberosity at each side, and a deep hollow behind, into which the process of the ulna fits, on extension of the arm.

The skeleton of the forearm consists of two bones. The radius lies on the outer side, a long bone with a shaft which is sharp on the inner side and rounded on the outer, a cup-like joint head or upper extremity, and a broad lower extremity joining at its lower surface with the bones of the wrist.

The ulna, which lies on the inner side, is also a long bone, the shaft having two surfaces with sharp edges; the upper extremity has a deep notch on the front for joining with the arm bone; the lower extremity is circular and disk-like, joining with the lower end of the radius.

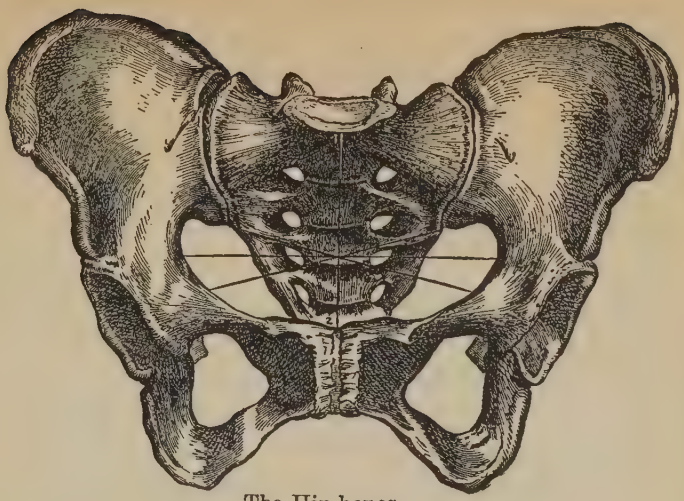
The bones of the wrist are eight in number, arranged in two rows.

The skeleton of the palm of the hand consists of five metacarpal bones, each of which is a miniature long bone with a shaft and two extremities, the metacarpal of the thumb being shorter and thicker than the others.

The phalanges, or bones of the fingers, resemble the metacarpals in form and in structure. They are three in number in each finger except in the thumb, which has only two. The distal phalanges are the smallest and have spade-shaped tuberosities at the heads to support the finger-nails.

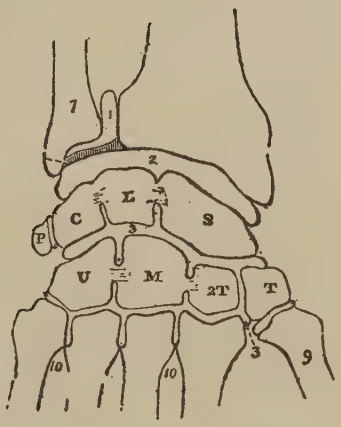
The lower limb may be divided into the hip, the thigh, the leg, and the foot. The bone of the hip, or innominate bone, forms the greater part of the bony girdle of the pelvis, the innominate bone of each side joining the sacrum behind and with its fellow of the opposite side at the front. It is an irregular curved, flat bone, consisting in its earlier stages of development of three parts: the ilium, the broad upper expanded portion which forms the prominence of the hip; the ischium, a curved bar of bone which forms the lower portion of the haunch; and the pubis, an L-shaped bar of bone. These three parts, which join together at the socket of the hip-joint, only unite completely to form the innominate bone about the twenty-third to twenty-fifth year of life.

The Radius.



The Hip-bones.

The Ulna.



The Bones of the Wrist.

The Shoulder-blade.

The Humerus.

The Phalanges.

The Thigh-bone.

The thigh has a single bone, which is the largest bone of the body, with a smooth, rounded shaft; the upper extremity consists of a rounded convex head which articulates with the acetabulum of the innominate bone, joined to the shaft by a neck; the lower extremity has, behind, a large tuberosity on each side, and in front and below there is a smooth articular surface which takes part in the formation of the knee-joint.

In front of the knee-joint is a small triangular flat bone called the kneecap, developed in the tendon on the front of the thigh, its posterior surface forming part of the knee-joint.

The Tibia.

The skeleton of the leg consists of two bones, the tibia and the fibula. The tibia, or leg-bone, is the stronger and larger of the two; it has a shaft with three surfaces and sharp borders, a broad, flat, upper extremity which has a tuberosity on each side of it, the external with a smooth surface to join with the fibula, and the lower extremity with a smooth joint surface below, while it is prolonged into a prominence, the ankle, on its inner side. In front there is an elevation called the tubercle, to which the tendon from the patella is attached. The broad, flat, upper surface articulates with the femur.

The Knee-joint.

The fibula is a thin, slender, long bone lying on the outer side of the leg, with a small smooth surface on the upper extremity to join with the tibia, and a prominent lower extremity which forms the external ankle.

The bones of the ankle are seven in number, arranged in three rows.

The Ankle-bones.

The skeleton of the anterior part of the foot consists of five metatarsal bones, resembling in form the metacarpals of the hand, but longer, more slender, and with the bases more prominent.

The phalanges of the toes resemble the similar bones of the fingers, differing, however, in that the middle and distal phalanges of the toes are very much smaller in proportion to the first phalanx than are those corresponding of the fingers.

The Phalanges of the Toes.

THE NERVOUS SYSTEM

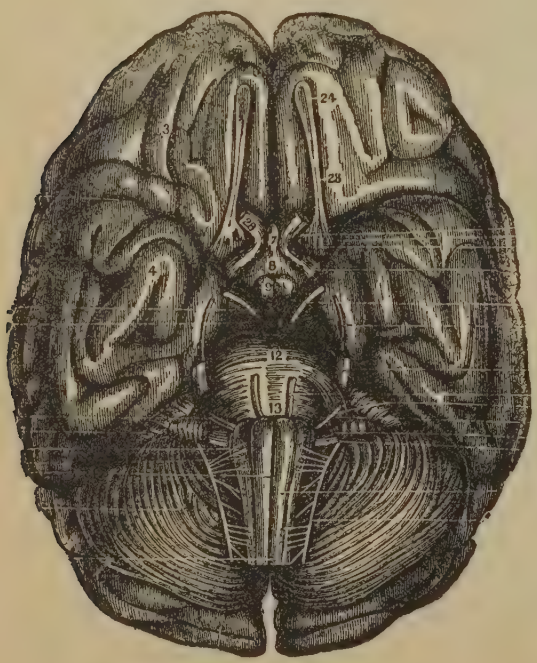
The nervous system includes: the central nervous system, comprising the brain and the spinal cord; the peripheral nervous system, comprising the cranial nerves, the spinal nerves, and the sense-organs (which are treated in a separate section), eye, ear, nose, tongue, and skin, and the sympathetic nervous system.

The tissue of the nervous system is composed of nerve-cells, nerve-fibers, and a specialized connective tissue termed neuroglia (nerve-glue). The nerve-cells vary from practically the smallest to much the largest in size of the cells of the human body, and they are irregular in shape and have numerous branches.

One of these branches, termed the axon, or axis-cylinder, is a nerve-fiber, while the others break up into finer branches and come into relation with similar branches of neighboring nerve-cells. The nerve-cells are situated mainly in the brain and spinal cord, and their function consists in receiving, sending out, or in taking part in transmitting nervous impulses. The nerve-fibers are the main processes, or axons, of the nerve-cells, only one axon coming from each cell.

THE CENTRAL NERVOUS SYSTEM

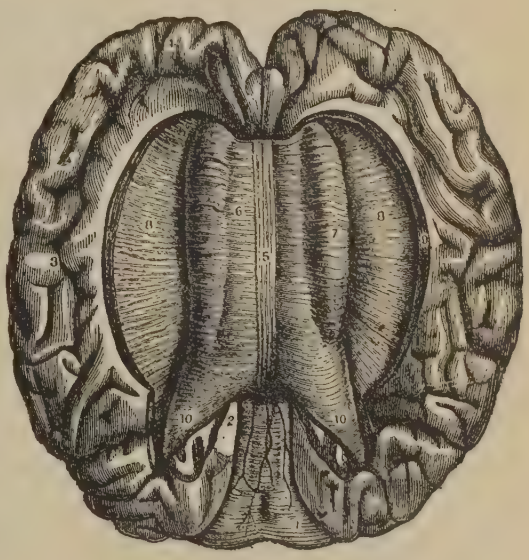
The Brain.—The brain is that part of the central nervous system contained within the skull, and it consists of the *cerebrum,* divided into two hemispheres, the great mass of the brain which dominates the working of the other parts of it; the *mid-brain,* a short stalk connecting the cerebrum with the *hind-brain,* which comprises the *pons Varolii,* bridging over the lower part of the stalk; the *cerebellum,* a large bi-lobular mass below and behind the cerebrum; and the *medulla oblongata,* the bulbous continuation of the spinal cord in the skull, below the cerebellum. The brain is enveloped by three membranes, the dura mater, the arachnoid mater, and the pia mater. The dura mater is the most external, closely applied to the interior of the cranial bones, and strong extensions of it dip down into the brain, the falx cerebri, a deep sickle-shaped partition, dividing the two hemispheres of the cerebrum, the tentorium cerebelli forming a floor between the cerebrum and the cerebellum, and the falx cerebelli separating the halves of the cerebellum behind. From above the brain is ovoid in shape, the broad end being toward the back, and the only part seen is the convex convoluted cerebrum, divided into two equal hemispheres by a deep cleft. From below the surface of the brain is more irregular, adapted to the floor of the skull. In front, the cerebrum presents a flattened surface, divided up the middle by the continuation of the cleft, on each side of which runs a slender band of nerve-fibers, the first cranial or olfactory nerve, ending in a bulb, the olfactory bulb.



The Cerebrum.

The hemispheres of the cerebrum are joined together at the foot of the cleft by a broad transverse band of fibers which radiate to the surface of each hemisphere, termed the corpus callosum. The substance of the cerebrum is composed of gray matter, consisting of groups of nerve-cells which form centers for sensation, thought, etc., and white matter, consisting of nerve-fibers held together by a connective tissue.

If the corpus callosum, or hard body, which joins the two cerebral hemispheres, be cut through so as to separate the hemispheres completely, the ventricles or internal cavities of the brain, normally containing a clear fluid, can be observed. The lateral ventricles, one in the middle of each cerebral hemisphere, are cavities with an anterior, a posterior, and a descending horn, and each communicates, by a small opening, the foramen of Monro, with the third ventricle. The third ventricle is a narrow cleft between the hemispheres, below the corpus callosum, and from it a channel leads backward to the fourth ventricle, which is a shallow quadrilateral cavity, tapering to a point at its upper and lower extremities, above and behind the pons Varolii.



The Corpus Callosum.

On the under surface of the brain, bounded at the sides by the temporal lobes of the cerebral hemisphere, from which the olfactory nerves go forward, is a space containing two thick bands, the crura cerebri. Immediately in front of the crura cerebri, two slender, flattened bands, the optic tracts, emerge from the cerebral hemispheres and join each other in the front of the space, forming the optic chiasm, from which the two optic nerves proceed forward and outward.

The mid-brain consists of the thick bands of nerve-fibers composing the crura cerebri, while its superior part consists of quad-

rigeminal bodies. Projecting from the back of the third ventricle over the quadrigeminal bodies is the pineal body, shaped like the stone of a cherry.

The hind-brain, as has been noted, consists of the pons Varolii, the cerebellum, and the medulla oblongata.

The pons Varolii forms a large rounded prominence on the under surface of the brain. It lies in front of the cerebellum, and its posterior surface forms the floor of the fourth ventricle. It is mainly composed of nerve-fibers linking up the different parts of the brain and going to and from the spinal cord, forming the white matter, and also of small masses of nerve-cells, forming the gray matter, irregularly scattered through the white matter.

The cerebellum lies below and behind the cerebrum and behind the pons Varolii and medulla oblongata, and consists of a median portion, at the sides of which lie two rounded lateral parts. Both in front and behind, the cerebellum has a marked notch in the middle, the hemispheres forming the sides of the notch. The surface is divided by curved parallel fissures, closely set together, into characteristic folds.

The cerebellum is attached to the other parts of the brain by three pairs of thick bands of fibers, the largest of which, the middle peduncles, pass forward on each side to the pons Varolii, the superior peduncles passing upward at each side to the inferior quadrigeminal bodies of the mid-brain, and the inferior peduncles passing downward at each side to be continued into the restiform bodies of the medulla oblongata.

The Medulla Oblongata.

The medulla oblongata is the transition stage between the spinal cord and the brain, its diameter increasing as it ascends upward. The anterior and posterior median fissures of the spinal cord are continued up the middle of the front and back of the medulla respectively, and longitudinal furrows divide the anterior surface of the medulla into three distinct areas on each side of the median fissure, from within outward, the pyramid, the olive, a bulging eminence, and the restiform body. The central canal of the

spinal cord is continued up the lower part of the medulla, and opens into the fourth ventricle of the brain upon the back of the upper part of the medulla, which constitutes the lowest part of the floor of the ventricle. The medulla is composed of nerve-fibers connecting the brain and the spinal cord, forming the white matter, and also irregular small masses of nerve-cells, forming the gray matter, scattered irregularly through the white matter.

The average weight of the human male brain is between forty-eight and forty-nine ounces, the female brain being lighter, but only in proportion to the lighter weight of the female body.

Physiology of the Brain.—The functions of the cerebrum are connected with the higher faculties, the will, the intelligence, the senses, the control of movements of the body, while the cerebrum has also a controlling influence on the functions of the other parts of the brain and of the nervous system generally.

The frontal lobes are the seat of the intellectual faculties, the occipital lobes are associated with the sense of sight, the temporal lobes with the sense of hearing and, on their internal surface, with the senses of taste and smell. The center controlling speech is on the left inferior frontal convolution, Broca's convolution, while the post-central convolution, immediately behind the fissure of Rolando, is associated with muscular sense. Farther in front of the middle of the convolution is the area controlling the eyes and head. The functions of the cerebellum are associated with the coördination of movements, while it gives force and tone to the general nervous system, qualities which have been found to disappear when it is removed. In the pons Varolii and medulla oblongata are centers governing the respirations, the beating of the heart, swallowing, vomiting, and other important physiological processes.

The Spinal Cord.—The spinal cord is that part of the central nervous system which lies within the spinal or vertebral canal. It is from sixteen to eighteen inches in length, extending from the opening in the base of the skull, where it becomes continuous with the medulla oblongata, to the upper border of the second lumbar vertebra, below which point it is represented by a thread-like structure, not of nervous tissue, termed the filum terminale. Like the brain, it is inclosed in three membranes.

The spinal cord is a somewhat flattened cylinder, thicker in the cervical region and in the lumbar region. It is divided into halves by the anterior median fissure in front and the posterior median septum behind. It does not fill the entire spinal canal, but stops opposite the first lumbar vertebra, where it breaks up into a bundle of nerves, covered by dura mater, the cauda equina, which runs to the end of the canal.

Like the brain, the spinal cord consists of gray and of white matter, the gray matter being arranged, as is seen on transverse section of the cord, in a crescentic form in the center of each lateral half of the cord, the two being joined by a bar in the middle, so that the whole has roughly the shape of the letter H. In the center of the middle bar, or gray commissure, is the central canal, which is continuous above with the fourth ventricle of the brain. The anterior limbs of the H-shaped gray matter are termed the anterior horns, and are larger and broader than the posterior limbs, or posterior horns. With the anterior limbs the anterior nerve-roots, containing motor nerve-fibers taking origin from the nerve-cells of the anterior horn, are connected, while with the posterior horns the posterior nerve-roots are connected, containing sensory nerve-fibers taking origin from the nerve-cells in the ganglia outside the cord and linking up with the nerve-cells of the posterior horn. The white matter of the cord surrounds the gray. It is composed of nerve-fibers and is arranged in definite longitudinal tracts.

The nervous system is built up of an aggregation of nerve-cells which give off a number of branching processes, and also one branch which is a nerve-fiber; by means of the processes nervous impulses are conducted to the cell and are then transmitted away from the cell, either so as to come into relation with the collecting processes of another cell, or to a sense organ.

Reflex action, as, for instance, when the foot is moved automatically in response to tickling the sole, is brought about by the nervous impulse traveling by the afferent sensory fibers to the nerve-cells in the ganglion of the posterior root of the spinal nerve, being then short-circuited by a branch from this nerve-cell to the nerve-cell of the lower segment of the motor path in the anterior horn of gray matter of the spinal cord, and being then transmitted by the several afferent motor fibers to the various muscles.

THE PERIPHERAL NERVOUS SYSTEM

The Cranial Nerves.—The cranial nerves, which arise directly from the brain, are arranged in twelve pairs.

The first, or olfactory nerve, is the nerve of smell.

The second, or optic nerve, is the nerve of sight.

The third supplies four of the muscles which move the eyeball.

The fourth, or trochlear nerve, winds around the pons Varolii as it leaves the brain, and supplies the superior oblique muscle of the eyeball, which gives a downward turn.

The fifth, or trigeminal nerve, leaves the brain by a broad root at the side of the pons Varolii and proceeds forward to the temporal bone, near the center of the base of the skull, where it expands into a broad ganglion. From this, three divisions of the nerve go forward.

The sixth, or abducent nerve, leaves the brain immediately below the pons Varolii and goes through the sphenoidal fissure of the orbit to supply the external rectus muscle of the eyeball, which turns the eye outward.

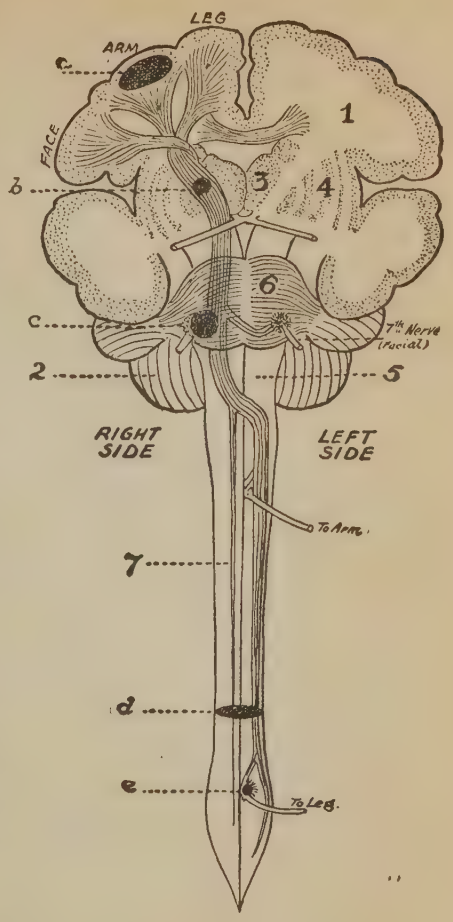


Diagram showing the course of the motor tracts through the brain and spinal cord. The front half of the brain is supposed to have been removed, and the reader is looking at its interior. 1, Cerebral hemisphere; 2, cerebellum; 3, optic thalamus; 4, lenticular nucleus; 5, medulla; 6, pons; 7, spinal cord. Note that the great majority of nerve-fibers cross over in the medulla from the right side to form the crossed pyramidal tract on the left side of the cord, while a smaller number continue straight down as the anterior pyramidal tract of the right side. For the numbers, see under Paralysis.

The seventh, or facial nerve, supplies, by its branches, all the muscles of the face except the muscles of mastication.

The eighth, or auditory nerve, leaves the brain between the pons Varolii and the cerebellum.

The ninth, or glossopharyngeal nerve, is the nerve of taste; it leaves the medulla oblongata and, with the tenth and eleventh nerves, passes through the jugular foramen to the neck, where it proceeds forward between the lower jaw and the hyoid bone. It supplies the back of the tongue and also gives branches to the tonsil and epiglottis.

The tenth, or vagus nerve, is partly motor and partly sensory; it leaves the medulla oblongata immediately below the root of the ninth, accompanies that nerve and, more intimately, the eleventh through the jugular foramen, then passes down the neck in the carotid sheath and enters the thorax behind the great veins. It gives branches to the pharynx, larynx, esophagus, stomach, respiratory tract, and lungs.

The Spinal Nerves and the Brain.

The eleventh, or spinal accessory nerve, leaves the medulla oblongata immediately below the roots of the vagus, eventually joining the vagus lower down. It supplies the larynx, the sterno-mastoid, and trapezius muscles.

The twelfth, or hypoglossal nerve, is the motor nerve which supplies the tongue.

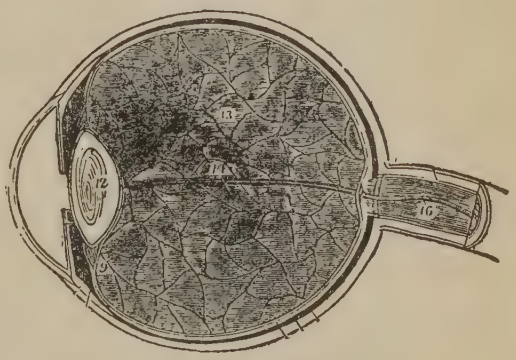
The Spinal Nerves.—The spinal nerves arise in a series of thirty-one pairs, from each side of the spinal cord. Each nerve is attached to the spinal cord by two roots, an anterior and a posterior, the former containing motor fibers and the latter sensory fibers, the two roots joining together before leaving the spinal canal. They then divide and join with one another to form plexuses from which proceed branches for the nervous supply of the limbs; the fourth to the eighth cervical and the first and second thoracic spinal nerves are involved in the brachial plexus, the last thoracic and the first four lumbar spinal nerves in the lumbar plexus, the fourth and fifth lumbar and first three sacral nerves in the sacral plexus, and the spinal nerves below the third or fourth sacral in the less important pudendal plexus.

The brachial plexus divides into three main nerve trunks, termed the outer, inner, and posterior cords, which supply the muscles and skin of the different parts of the body in the region.

THE SPECIAL SENSE-ORGANS

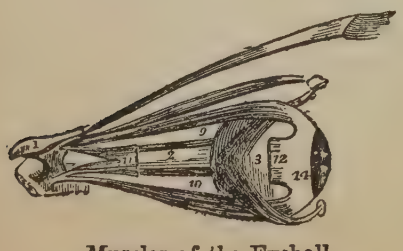
The Eye.

The Organ of Sight.—The sense-organ of sight is the eye, the essential part of which is the eyeball, contained in a bony cavity in the front of the skull, the orbit, communicating with the brain by the optic nerve, and moved in the cavity by a set of small muscles.



Side View of the Eyeball.

The eyeball is an almost perfect sphere of about an inch in diameter, the front part bulging slightly forward. It has three coats, the outer protective fibrous covering being white and opaque except in the more prominent front part, where it is transparent and forms the cornea. The sclerotic is continued behind on to the optic nerve, which pierces it. The middle coat consists of the choroid membrane, the ciliary processes, and the iris, the first of which does not extend quite so far forward as the canal of Schlemm, being deeply colored with pigment cells and containing a great number of fine blood-vessels running in it; the ciliary processes extend radially round the eyeball at the junction of the sclerotic and cornea, containing the radiating fibers of the ciliary muscle, the function of which is to regulate the lens in accommodating the eye to near objects; while the iris is a thin, colored, membranous curtain hanging in front of the



Muscles of the Eyeball.

lens of the eye, perforated in the middle with a circular hole, the pupil, for the transmission of light.

The inner coat of the eyeball is a delicate structure termed the retina, which becomes thinner toward the front of the eye. The retina is composed of eight layers of nervous structures: (1) the pigmented layer, formed of pigmented, hexagonal, flat cells; (2) the layer of rods and cones, minute nervous structures which receive the impressions of light, the rods being more numerous except at an area in the middle of the retina, the yellow spot, the point of keenest vision in the eye, which has only cones; (3) outer granular layer of oval cells; (4) outer molecular layer of interlacing cell branches; (5) inner granular layer of oval cells; (6) inner molecular layer of interlacing cell branches; (7) layer of large nerve-cells; (8) layer of nerve-fibers which go to the optic nerve. That part of the retina where the optic nerve enters is insensitive to light, and is known as the "blind spot."

The eyeball contains three refractive media through which the rays of light pass, the aqueous humor in front, the crystalline lens in the middle, and the vitreous humor behind.

The aqueous humor is a clear, watery fluid contained in the anterior chamber of the eye, between the cornea and the lens, and is composed of water with a very slight solution of albumin and salt in it, believed to be secreted by the choroid membrane.

The crystalline lens is held in position by ligaments from the ciliary processes, and is situated behind the pupil, in contact with the iris, making a depression into the vitreous humor behind it. It is convex on both sides.

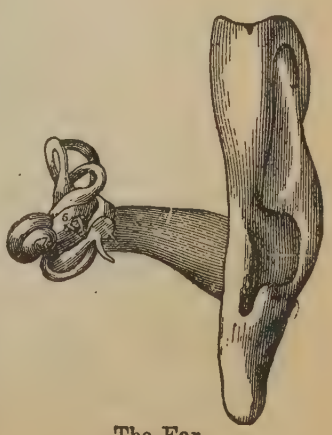
The vitreous humor occupies the posterior chamber of the eye, behind the lens, and is a soft, transparent jelly of practically the same composition as the aqueous humor.

When a luminous object is in front of the eye the rays from it strike the cornea and converge from it slightly to pass through the aqueous humor. Those rays of light which fall on the parts of the cornea farthest out are shut off by the iris, the central rays being allowed to pass through the pupil to the lens, which, having a high refractive index, greatly converges them. The rays then pass through the vitreous humor and are brought to a focus on the sensitive retina, forming there an inverted, but otherwise exact, image of the object in front of the eye, and this impression is transmitted by the optic nerve to the brain

The size of the pupil can be increased or diminished according as the intensity of the light is less or greater, the amount of light entering the eye being modified so that the image brought to a focus upon the retina is sharply defined. The eye is accommodated for objects of varying distances, in order that exact images may be focussed upon the retina, by adjusting the lens, which is brought about by changing the curvature of its anterior surface. In accommodating the eye for near objects the curvature of the anterior surface, and therefore the diameter of the lens, is increased, and, in addition, the pupil is contracted, while in accommodation for distant objects the curvature of the anterior surface, and therefore the diameter of the lens, is decreased, and the pupil is dilated.

The muscles which move the eyeball in the orbit consist of the four rectus muscles, superior, inferior, internal, and external, which move the eyeball respectively upward, downward, inward, and outward; the superior oblique muscle, which gives the eye a downward and outward turn; and the inferior oblique muscle, which gives the eye an upward and outward turn. The eyelids protect the eye in front, and are composed of skin with some fibers of the muscle, the sphincter of the orbit plates of fibro-cartilage, termed the tarsal plates, glands which lubricate the edges of the lids, large modified sweat-glands (which, when inflamed, cause the well known "sty"), and a layer of mucous membrane which covers the back of the eyelids and also the front of the eyeball, termed the conjunctiva.

The *lachrymal gland* secretes the tears, which bathe and prevent irritation of the cornea and conjunctiva, and is situated in the upper and outer part of the orbit. The tears are conveyed away by two small canals from the inner angle of the eye communicating with the nasal cavity.

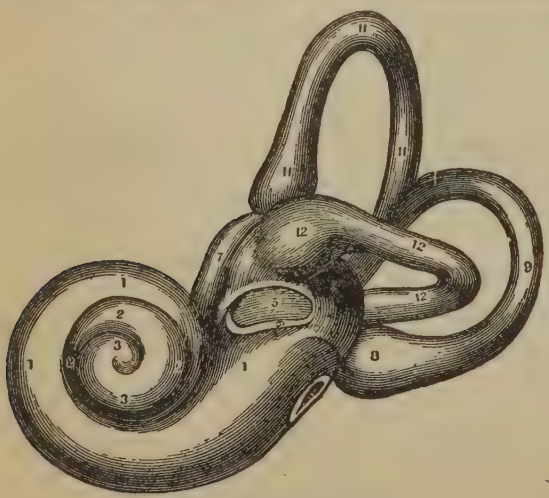


The Ear.

The Organ of Hearing.—The sense-organ of hearing is the ear, which is divided into three parts, the external, the middle, and the internal ear. The external ear consists of two parts, the auricle, a fibro-cartilaginous framework covered with skin, the purpose of which

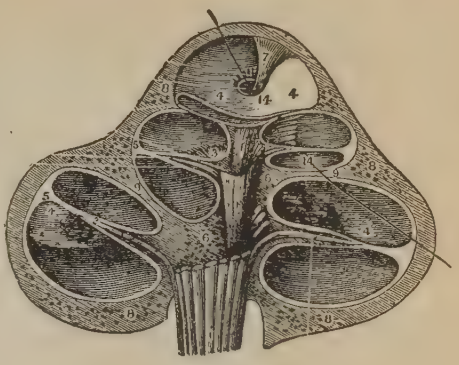
is to catch the vibrations of the air, and the auditory meatus, a bony and in part cartilaginous canal passing into the temporal bone and ending at the tympanic membrane which separates it from the middle ear. The auditory meatus is lined with skin, the glands of which secrete wax. The middle ear, or cavity of the tympanum, is a small cavity situated in the temporal bone, the purpose of which is to transmit to the internal ear the sounds which strike the tympanic membrane. It is filled with air, conveyed to it from the back of the nasal cavity by the partly cartilaginous, partly bony Eustachian tube, so as to increase the action of the sound-conveyers, and to keep the pressure equal on each side of the tympanic membrane. Between the middle ear and the internal ear are two fine membranes covering little openings called the fenestra rotunda and the fenestra ovalis; and the vibrations caused by sounds are transmitted from the tympanic membrane to the membrane of the fenestra ovalis, and thus propagated to the internal ear by a chain of little bones in the middle ear, called, from their shapes, hammer, anvil, and stirrup. In the middle ear there are two little muscles, the tensor tympani, the larger of the two, arising from the roof of the Eustachian tube and being inserted on the handle of the hammer, its action being to pull the handle of the hammer inward and so make the tympanic membrane tense. The stirrup muscle arises from a projection on the wall of the cavity and is inserted on the head of the stirrup, its action being to pull the head of the stirrup backward. The internal ear is composed of a series of cavities in the temporal bone, comprising the vestibule, the central cavity, into the superior part of which open three canals, named, from their shape, the semicircular canals, while the front part of the vestibule is prolonged into a spinal canal resembling the shell of a

The Stirrup.



The Semicircular Canals.

common snail, the cochlea. A spiral bony shelf, projecting from the center of the coil, divides the canal of the cochlea incompletely into two passages, the upper termed the scala vestibuli, and the lower the scala tympani, which communicate at the top.



The Cochlea.

The Organ of Smell.—The sense-organ of smell is situated in the nose, and may be considered as divided into an external or projecting part, and an internal part or nasal cavity. The upper part of the nose is formed by the nasal bones proper and by the nasal processes of the superior maxillary bones. At the lower part are two horizontally placed openings, the nostrils, across which some stiff hairs usually project, forming passages into the internal part of the nose. These passages are separated by a vertical cartilaginous septum, continuous with the vomer bone, while the outer walls of the passages are formed on each side by an upper lateral and a lower lateral cartilage. To these are attached the small and feeble muscles of the nose, arising from the skin above the root of the nose.

The internal nose, or nasal cavity, is divided into three passages or meatuses by spongy bones which project into them from the outer wall, the two upper bones being shelf-like projections, while the lowest is a small, separate, bony plate, jointed with the superior maxillary and palate bones.

The Organ of Taste.—Taste is the function of special sense-organs which have their situation mainly in the tongue. The mucous membrane of the tongue has upon it a great number of little projections, or papillæ. The taste-bulbs are minute circular bodies from an opening in one end of which five hairs project, while an end filament of a nerve enters at the other end. In addition to these taste-bulbs, there must be other sense-organs of taste in the tongue which have not yet been recognized. Many so-called tastes are in reality smells, the olfactory sense being much more sensitive than the sense of taste; for instance, an apple cannot be distinguished from a potato by taste alone.

A Highly Magnified Section of the Epidermis.

The Organ of Touch.—The skin forms a complete covering of the whole body, and consists of two main layers, the epidermis or scarf-skin being the outer, and the dermis or true skin the inner. The epidermis is produced from the true skin,—an exudation from it in the shape of a fluid which is spread out as a thin layer, and *dries* up into flattened scales. The cuticle is composed chiefly of these scales, and is constantly being rubbed off as scurf, while new layers are forming underneath. It is composed of five layers, the first of horny scale-like cells; the second is a thin layer of scale-like cells without horny material; the third a thin layer of more swollen cells containing granules; the fourth is a deeper layer of polygonal cells connected with one another by minute "prickles," and in them is found the pigment of the skin of the colored races; while the fifth consists of one layer of elongated cells.

The dermis is composed of two layers, that nearer to the epidermis being raised into papillæ which project into corresponding depressions in the under surface of the epidermis. These papillæ contain loops of blood-vessels, many of them containing a touch-corpuscle, in which nerve-filaments end, and is one of the sense-organs of touch.

In the deeper layer of the dermis the structure is looser and there is a considerable deposit of fat, while the hair-follicles and the sebaceous glands (which pour a fatty secretion into the upper part of the hair-follicles to lubricate the hairs) are situated in this layer.

A Highly Magnified Section of the Dermis.

The sweat-glands are most numerous on the palms of the hands and the soles of the feet. The sweat, like the urine, is an excretion of the body, and contains practically the same salts as the urine does and in the same relative amount. During twenty-four hours about two pounds of sweat are excreted by a man.

The Sweat-glands.

The nails are especially modified parts of the epidermis to protect the sensitive ends of the fingers; beginning at the root, which is covered by a fold of skin, a nail lies upon a very sensitive and very vascular part of the dermis, the nail-bed, and ends at a free margin.

To the skin belongs the sense of touch.

An important function of the skin is the regulation of the temperature of the body. The greater the quantity of blood that passes through the skin, the greater is the amount of heat lost by conduction, radiation, and evaporation.

The production of sweat has a cooling effect, as heat is necessary for its evaporation, and this heat comes mainly from the body.

THE SYMPATHETIC NERVOUS SYSTEM

The sympathetic system is composed of a series of ganglia united with one another by nerve-cords running on each side of the vertebral column; the ganglia are three in number in the cervical region, in number corresponding to the vertebræ in the dorsal, lumbar, and sacral regions, and one ganglion in the coccygeal region. From each ganglion a nerve of gray fibers goes to the corresponding cranial or spinal nerve and from it a branch is received in return, to form intricate plexuses in some of which are found ganglia. The chief of these plexuses are: the solar plexus behind the stomach and around the celiac axis of the

aorta, with which are associated the two semilunar ganglia; and the hypogastric plexus below the bifurcation of the aorta.

The sympathetic fibers which supply the muscular walls of the blood-vessels regulate their contraction and dilatation. Branches from the different sympathetic ganglia control the dilatation of the pupil of the eye, the secretions of the sweat-glands, the movements of the alimentary canal, and the secretions of the salivary glands, glands of the stomach and intestine, liver, and pancreas.

THE ARTERIAL SYSTEM

The Arteries.—The arteries of the body consist of two sets, those which convey the blood to the tissues of the body, the arteries of the systemic circulation, and those which convey the blood to the lungs, the arteries of the pulmonary circulation.

The main arterial trunk of the systemic circulation is the aorta, which commences at the upper part of the left ventricle, proceeds upward and to the right for a short distance, and then, curving upon itself backward and to the left, descends through the thorax and through the abdomen as far as the level of the fourth lumbar vertebra, where it ends by dividing into the two common iliac arteries.

The opening of the aorta into the ventricle is guarded by a valve composed of three pocket-like segments. The ascending part of the aorta, about two inches in length, is inclosed within the outer layer of pericardium.

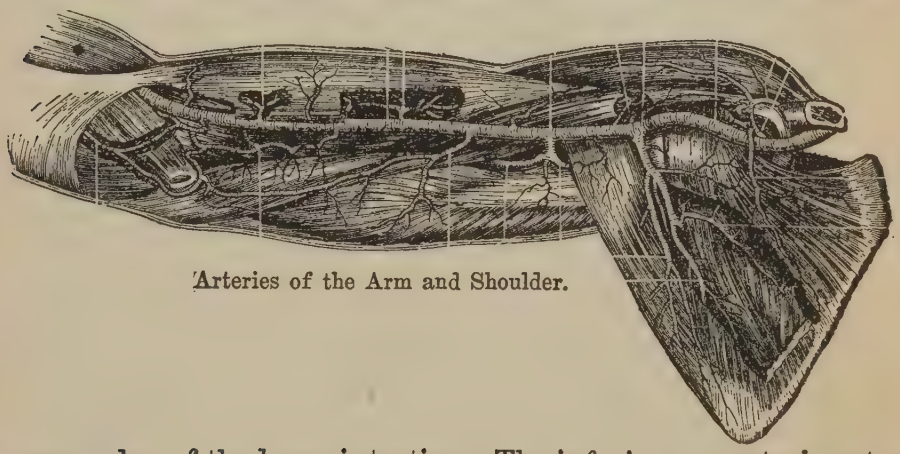
About the level of the second costal cartilage the aorta commences to arch, passing backward and to the left in front of the windpipe, then to the left of the windpipe and gullet, over the bifurcation of the pulmonary artery, while overlapped on the left side and in front by the lungs.

From the arch of the aorta spring the innominate artery (which divides into the right subclavian and right common carotid arteries), the left common carotid artery, and the left subclavian artery. On each side the common carotid artery divides about the middle of the neck into the external carotid artery (which supplies the neck and face) and the internal carotid artery (which supplies the brain). The subclavian artery gives off a number of branches on each side; the vertebral artery (which gives branches to the neck and eventually supplies

the brain) branches to the neck, the shoulder, and the upper part of the chest wall; while the main trunk becomes the axillary artery in the region of the shoulder (where it gives off several branches), then the brachial artery in the upper arm supplying that part with its branches, which divides at the bend of the elbow into the radial and ulnar arteries of the forearm, and these two eventually form arches in the palm of the hand for the supply of the hand and fingers.

About the level of the fourth thoracic vertebra the arch of the aorta ceases and the descending aorta commences, the portion within the thorax being about seven or eight inches in length. This part of the aorta lies upon the vertebral column, the left lung being in relation on the left side, the thoracic duct and gullet, and, lower down, the right lung, in relation on the right side.

The superior mesenteric artery arises from the front of the aorta about half an inch below the aorta, and passes between the two layers of the mesentery, the peritoneal fold which holds the intestines in place. It gives off numerous branches to the small intestine, and to the cecum, appendix, ascending colon, and trans-



Arteries of the Arm and Shoulder.

verse colon of the large intestine. The inferior mesenteric artery arises from the left side of the aorta about 1½ inches before it bifurcates, and passes down in the abdominal wall behind the peritoneum. It supplies the descending colon, iliac colon, pelvic colon of the large intestine, and the rectum. The pair of renal arteries arise from the side of the aorta below the middle suprarenals, and are large arteries supplying the kidneys. The two spermatic (in the male) or ovarian (in the female) arteries are long, slender arteries arising from the front of the aorta about

Arteries of the Leg.

an inch below the renals, proceeding to the testicles, or (in the female) down to the pelvis to supply the ovaries.

The two common iliac arteries are the arterial trunks formed by the bifurcation of the aorta, commencing at the fourth lumbar vertebra, proceeding outward on each side behind the peritoneum, and dividing at the sacro-iliac joint of each side into the internal and external iliac arteries. The internal iliac artery runs downward into the pelvis; its anterior division gives off branches to the bladder, rectum, vagina, and uterus (in the female), the internal pubic branch (to the perineum and, in the male, the penis) and sciatic branch (to the region of the buttock). The external iliac artery runs forward and outward along the brim of the pelvis, beneath the peritoneum, gives off the branches to the anterior abdominal wall, and passes into the thigh as the femoral artery. The femoral artery gives off a large branch, the profunda femons, to the deep parts of the thigh, and passes backward to the space behind the knee, where it is called the popliteal artery, and divides at the lower part of this space into the posterior tibial artery (to the back of the leg) and the anterior tibial artery (which passes to the front of the leg).

The main arterial trunk of the pulmonary circulation is the pulmonary artery, which arises from the upper and left part of the right ventricle, being rather larger at its commencement than the aorta. It proceeds upward and backward somewhat behind the aorta, and, after a course of about two inches, it terminates at the level of the upper margin of the sixth dorsal vertebra by dividing into right and left branches.

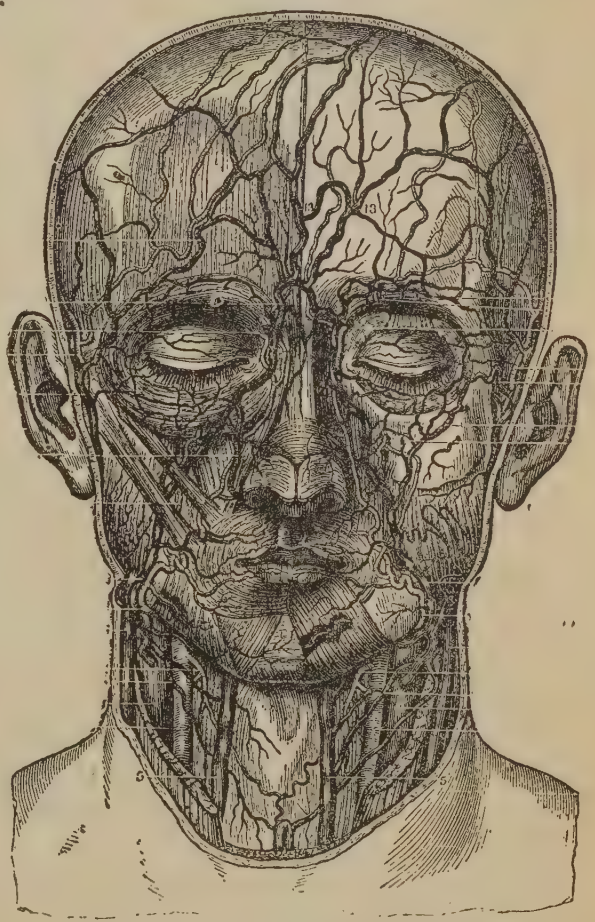
Arteries of the Foot.

The right branch of the pulmonary artery, rather the larger and longer of the two, passes outward and backward, and enters the root of the right lung, proceeding far down into its substance.

The left branch of the pulmonary artery passes outward and below the arch of the aorta, to enter the root of the left lung.

The pulmonary artery, as has already been noted, conveys "venous" or impure blood *from* the heart *to* the lungs, while the pulmonary veins convey "arterial" or purified blood *from* the lungs *to* the heart.

The pulmonary veins are four in number, two from each lung opening into the left auricle of the heart. The upper right pulmonary vein passes from the root of the right lung behind the superior vena cava, and the lower right pulmonary vein behind the right auricle, both to end at the upper and back part of the right margin of the left auricle. Both the upper and the lower left pulmonary veins pass from the root of the left lung in front of the descending aorta, to end at the upper part of the left border of the left auricle.



Arteries and Veins of the Face and Neck.

The Veins.—The veins of the systemic circulation take their origin at the termination of the capillaries, and they join one another to form larger and larger vessels as they proceed nearer the heart. The veins are either superficial veins, which lie in

Side View of the Arteries and Veins of the Head and Neck.

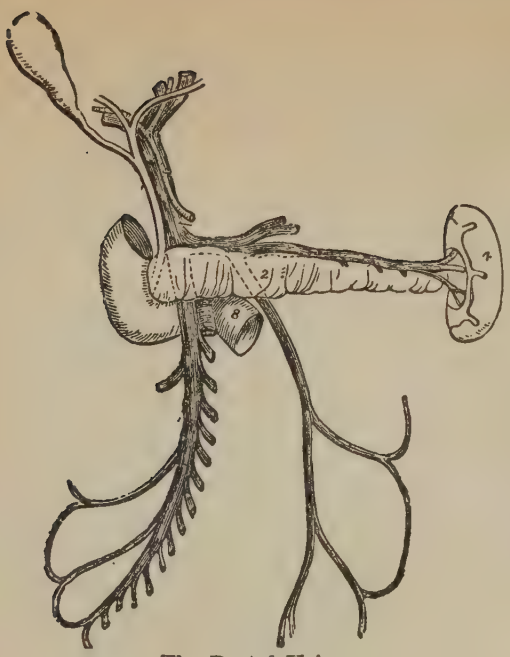
the superficial fascia, sometimes accompanying superficial arteries; or deep veins, which accompany arteries, in the case of the smaller arteries two veins usually accompanying one artery; or visceral veins, which accompany the arteries to the different organs.

All the systemic veins terminate by forming three venous trunks which open into the right auricle of the heart, the superior vena cava and the inferior vena cava.

The superior vena cava is formed, at the level of the first right costal cartilage, by the junction of the two innominate veins, and it descends, proceeding slightly toward the right, for about three inches until it opens into the upper and back part of the right auricle. It returns the blood to the heart from the head and neck, the upper limbs, and the chest wall.

The inferior vena cava is formed, at the level of the fifth lumbar vertebra, by the junction of the two common iliac veins, and ascends through the abdomen on the right side of the vertebral column, passes through the diaphragm, and ends in the lower and back part of the right chamber. It returns the blood from both the lower limbs and from the walls and the contents of the abdomen and the pelvis.

In addition to the systemic and the pulmonary veins there is another group of veins that forms the portal system, which is peculiar in both beginning and ending in capillaries. This system comprises the veins which convey the blood from almost the entire small and great intestines and from the spleen and the pancreas to the liver; the smaller tributaries from these organs accompany, as usual, the corresponding arteries, but the larger trunks leave them, the inferior mesenteric vein joining the splenic



The Portal Veins.

vein, behind and to the left of the neck of the pancreas, at the level of the first lumbar vertebra, to form the portal vein, which proceeds to the liver. The portal vein ascends in front of the inferior vena cava, then passes forward behind the common bile-duct, where it divides into a right and left branch. These branches pass into the liver substance, to divide up eventually into minute capillaries around and within the liver lobules.

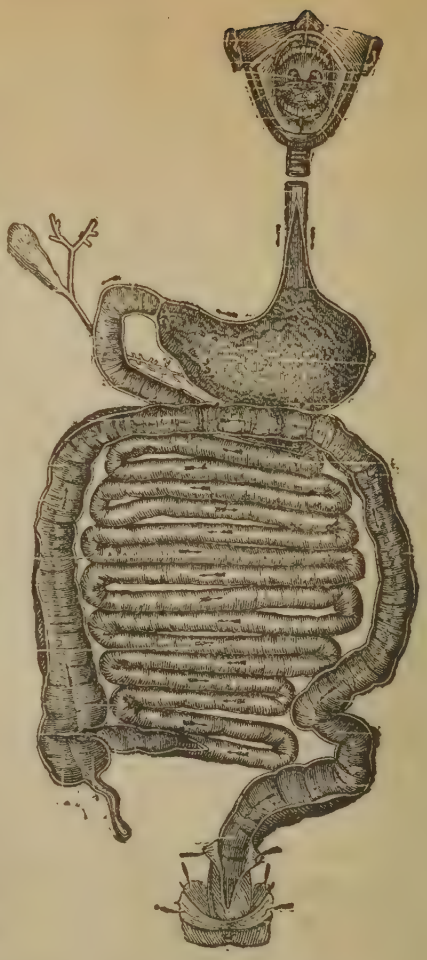
THE DIGESTIVE SYSTEM

The digestive system in man is composed essentially of a lengthy and complicated tube, called the alimentary canal, at one end of which enters the food from which nutriment is absorbed during its gradual process through the tube, and undigested debris is ejected at the other end. It includes the mouth (which receives the secretion of the salivary glands), the pharynx, the gullet, the stomach, the small intestine (which receives the secretions of the liver and the pancreas), and the large intestine, which ends on the exterior and the anus.

The Mouth.—The mouth has as its chief function the mastication of the food. It is lined with mucous membrane, and is bounded in front by the lips, which are movable muscular folds, externally covered by skin and internally by the mucous membrane of the mouth, their free edges covered by a modified mucous membrane. The walls of the mouth, or the cheeks, are formed chiefly by the buccinator muscle, also in front by the orbicularis oris, behind by the masseter muscle, and by the other less important muscles inserted around the mouth; externally the

cheeks are covered by the superficial fascia and skin, and internally by the mucous membrane of the mouth. The roof of the mouth is formed by the hard palate in front and the soft palate (composed of two layers of mucous membrane inclosing muscular and connective tissue) behind; below, the floor of the mouth is covered by mucous membrane which stretches over the muscular diaphragm connecting the two sides of the body of the lower jaw; and behind, the mouth opens into the pharynx, the tonsils being placed between the anterior and posterior pillars of each side, and the uvula projects downward from the back of the soft palate into the passage.

The tongue, which is a fleshy tissue and covered with mucous membrane, projects upward and forward into the cavity of the



The Alimentary Canal.

The Tongue.

mouth; its anterior part is free, while the posterior part, or root, is attached to the hyoid bone and the lower jaw. From above and below, the dental arches of the upper and lower jaws respectively project into the mouth. These arches are formed with the teeth, and they are covered with fibrous tissue which also surrounds the necks of the teeth, and, covered with mucous membrane, forms what are termed the gums.

The Teeth.

Six salivary glands, arranged in three sets of pairs, pour their secretion into the mouth. The sublingual glands, almond-shaped and about an inch and a half long, are placed at each side upon the floor of the mouth, the body of the lower jaw being on the outer side, and the mucous membrane of the floor of the mouth above. From these glands numerous small ducts open upon the floor of the mouth. The submaxillary glands are placed inside and in front of the ...gle of the jaw at each side, the body of the lower jaw on th... side, while the facial artery frequently passes through it... cretion reaches the mouth by Wharton's duct, which ... ward below the floor of the mouth, on which it even... beneath the tongue. The parotid glands are triang... and are situated at the sides of the head, in fron... the ears.

The Pharynx.—The pharynx, or cavity of th... five inches in length, and lies beyond the mout... it by the soft palate and the pillars of the fa... the tonsils) on each side, and it extends upw... part of the r... cavity. Like the mouth ... with smoot... mbrane, while i... composed ... uscles o... upper pa... joi... is an o... which ... to co... par... ele... s...

he voice-organ; the opening is protected by the epiglottis, a little lid which projects backward into the pharynx and closes down over the entrance of the larynx during the act of swallowing.

The Gullet.—The esophagus, or gullet, is a narrow tube, about ten inches in length, which connects the pharynx with the stomach. It has strong muscular walls, and is lined with mucous membrane which secretes viscid mucus. The gullet is situated n the neck, between the windpipe in front and the vertebral olumn behind, and, in the thorax, it is still placed behind the indpipe, and in front of the vertebral column as far down as he bifurcation of the windpipe, thereafter lying with the aorta first on its left side and, lower down, behind. Eventually it pa through the diaphragm and joins the stomach.

The Stomach.—The stomach is the most dilated part of the digestive system, and is the receptacle for the food after it has been masticated and swallowed. It is pear-shaped, curved upon itself, and it is situated on the left side, at the back of the upper part of the abdomen, just below the diaphragm, which is between it he heart and d in which formed

while the more cylindrical lower end, which joins the small intestine, is termed the pyloric end.

Interior of the Stomach.

The walls of the stomach have an outer serous coat or peritoneum, a muscular coat, a submucous coat, and a mucous internal lining. The muscular coat has an outer layer of longitudinal muscle-fibers, a middle layer of circular muscle-fibers (which are less complete toward the cardiac end), and an inner layer of oblique muscle-fibers (which disappear toward the pyloric end). The submucous coat has a great number of little blood-vessels running through it to supply both the stomach generally and its numerous glands with nourishment. The lining mucous membrane of the stomach is soft and thrown into numerous folds, while it is pitted with the openings of the great number of minute gastric glands. The farther or pyloric end of the stomach is marked by a thickening of the wall due to a development of the circular muscle-fibers forming a sphincter, or valve.

The Intestines.

The Small Intestine.—The small intestine is that part of the alimentary canal between the stomach and the large intestine, and, about twenty feet in length, its coils occupy the greater part of the abdominal cavity. It is considered in three parts, the upper or duodenum, the middle or jejunum, and the lower or ileum.

The duodenum begins at the left outlet of the stomach and is about eleven inches in length, curved in the form of the letter C, and fixed to the posterior wall of the abdomen. The first part goes

outward and backward from the pylorus; the second part, into which the ducts of the liver and pancreas open, is then directed downward behind the transverse colon; the third part proceeds inward and upward in front of the vena cava.

The jejunum, or upper part of the small intestine beyond the duodenum, is about seven or eight feet in length, and is held in position in the abdominal cavity by a large fold of peritoneum, attached to the posterior wall of the abdomen.

The ileum, or lower part of the small intestine beyond the jejunum, is about ten or twelve feet in length, and is held in position in the abdominal cavity by the mesentery. It opens into the large intestine rather over two inches from the end, its opening being protected by a valve.

The liver is a large mass of a reddish-brown color situated in the upper right side of the abdominal cavity, dome-shaped but of irregular form, and about three pounds in weight. It may be best described as having two surfaces, the parietal surface, facing upward, forward, and outward to the right, and the visceral surface, facing downward, backward, and inward to the left, while the two surfaces are separated by a sharp inferior margin.

The parietal surface is in close relation, alike above, in front, and at the right side, to the under surface of the diaphragm, the rounded arch of which gives the liver its dome-shaped appearance. In front, however, a small part of the anterior aspect of the parietal surface projects beyond the limit of the diaphragm and the ribs, and is in direct relation with the anterior abdominal wall.

The visceral surface is divided into a right and a left lobe by a deep longitudinal fissure. The left lobe has concave impressions made upon it by the stomach and gullet.

Extending horizontally from the middle of the longitudinal fissure to the center of the surface of the right lobe is the transverse fissure, a deep fissure by which the portal vein, hepatic artery, and hepatic ducts enter the liver. From the outer end of the transverse fissure extends obliquely the pear-shaped gall-bladder, bound down to the visceral surface by the peritoneum, its duct joining the liver-duct to form the common bile-duct.

The inferior margin, which separates the parietal from the visceral surface, corresponds with a line drawn on the surface

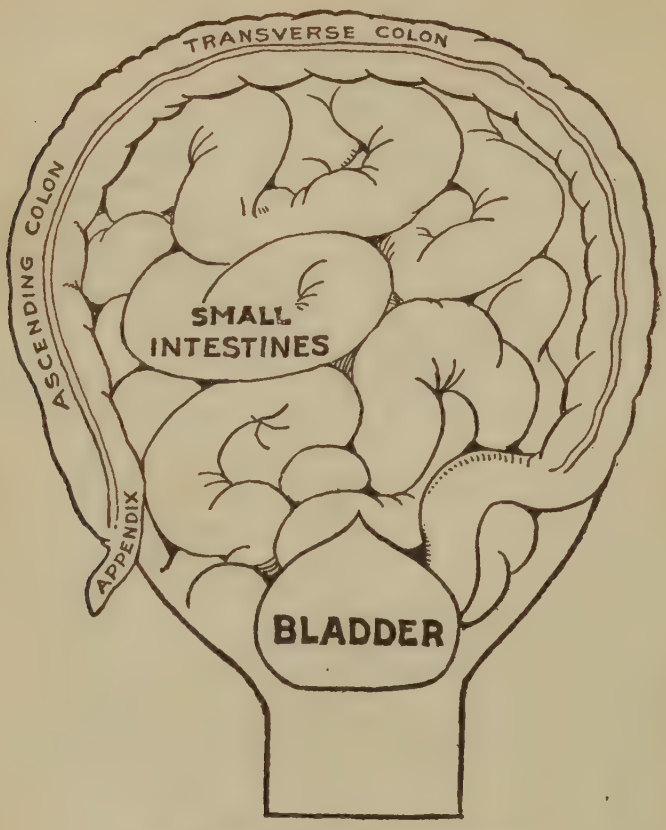
of the body from a point about an inch below and internal to the left nipple to a point midway between the lower end of the breast-bone and the navel, then obliquely to a point about half an inch below the tip of the tenth rib.

The pancreas is a long gland, of whitish color, situated in the upper part of the posterior abdominal wall, shaped like the letter J, about six or seven inches in length and about three and a half ounces in weight. It may be described as having a head, a neck, a body, and a tail. The head lies within the curve of the duodenum, with which it is in close relation, particularly above and on the right side, the superior mesenteric passing from beneath the neck of the pancreas, in relation to its left side; in front the transverse colon is in contact, while behind it lies upon the vena cava and the aorta. The neck is the narrow part of the pancreas between the head and body; above and in front of it is the duodenum, the superior mesenteric vessels pass beneath it, and it lies upon the beginning of the portal vein.

The Large Intestine.—The large intestine is best considered under several divisions: the cecum, the saccular dilatation and widest part of the intestine beyond the ilio-cecal valve, into the end of which opens the narrow blind tube called the vermiform appendix; the ascending colon, going upward on the left side of the abdominal cavity as far as the liver; the transverse colon, extending right across the front of the upper part of the abdominal cavity; the descending colon, going vertically downward on the left side; and the rectum, which is a dilated part just above the opening of the alimentary canal upon the surface. The anus, which is the part actually opening on the surface, is usually kept tightly closed by strong circular muscular fibers which surround it.

The abdominal cavity, in which the greater part of the digestive system is situated, is lined by a glistening serous membrane, the peritoneum, consisting of two communicating sacs, the greater and the lesser. The greater sac lines most of the abdominal cavity and covers most of the organs contained within it, while the smaller sac is placed behind the greater, mainly between the posterior wall of the stomach and the posterior abdominal wall, and it opens into the greater sac, which is situated immediately below the caudate lobe of the liver. The front wall of the stomach

is covered by the peritoneum of the greater sac and the posterior wall of the lesser sac; and from the lower border or greater curvature of the stomach hangs down over the coils of small intes-



The Large and the Small Intestines.

tine a peritoneal apron, the greater omentum, formed of a double layer of peritoneum, the anterior layer derived from the greater sac and the posterior from the lesser sac.

THE LYMPHATIC SYSTEM

As the walls of the vessels in which the blood flows prevent it from ever coming in intimate contact with the cells of the tissues (even when it passes through the smallest capillaries there being a layer of cells intervening), it is necessary that some agent should exist for conveying the nourishment from the

blood directly to the cells of the tissues. This function is carried out by the fluid called lymph. This is a colorless, watery fluid, alkaline and coagulable. It contains white corpuscular elements which are derived mainly from the lymph-glands, and after a meal the lymph coming from the intestines contains fat-globules and dissolved nutritive substances from the digested food, giving it a milky appearance. This exudes from the blood through the capillary walls, and, after nourishing the cells of the tissues, it is taken up by the lymphatic vessels and is eventually poured into the great veins of the neck by the two main lymphatic vessels, the thoracic duct and the right lymphatic duct.

The Lymphatic Glands.

The lymph-capillaries join together to form the lymphatic vessels, and they are furnished with valves so that the lymph can flow only in the direction of the thoracic duct and the great veins. The lacteals are those lymphatic vessels which convey the digested food from the intestine.

The main lymph-vessels are the thoracic duct and the right lymphatic duct. The thoracic duct, being about sixteen or eighteen inches long, commences as a dilated sac, situated under the right region of the diaphragm, at the level of the first two lumbar vertebræ. The thoracic duct proceeds upward, passes through the aortic opening of the diaphragm, and enters the chest. It proceeds on the right side of the aorta as high as the level of the fifth thoracic vertebra, and then it suddenly crosses behind the aorta, continuing its course upward at the left side of the ver-

tebral column to the root of the neck, where it arches over the apex of the lung and opens into the junction of the left internal jugular and subclavian veins.

Lymphatic Glands of the Arm.

The right lymphatic duct is rather less than an inch in length, and opens into the right innominate veins.

Lymphatic glands are usually irregularly oval bodies in shape, situated generally in the neighborhood of the great blood-vessels or in the subcutaneous tissue. A lymphatic gland has a capsule of fibrous tissue from which fibrous bands go into the substance of the gland. In the gland substance are sinuses through which the lymph-stream flows. The glands are placed in different positions in the courses of the lymphatic vessels, and act as filters. The more important sets of lymphatic glands in the body may be noted in the following order:

The lymphatic glands of the neck: below the lower jaw; along the course of the external jugular vein; along the course of the internal jugular vein.

The lymphatic glands of the upper limb: above the internal point at the elbow; along the vessels in the armpit; immediately below the collar-bone.

The lymphatic glands of the lower limb: in the region of the groin; along the course of the femoral vein; in the space behind the knee.

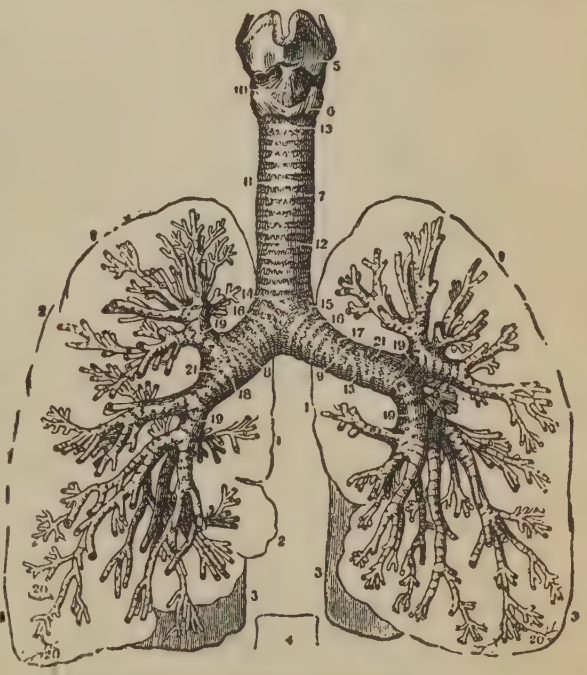
The lymphatic glands of the chest: on upper surface of the diaphragm; along the sides of the bronchi; on the arch of the aorta in front of the windpipe.

The lymphatic glands of the abdomen: along the borders of the stomach; below the transverse fissure of the liver; over a hundred scattered in the mesentery; along the course of the common iliac arteries; along the course of the external iliac arteries; in front of the internal iliac arteries; and at the sides of the lumbar region of the vertebral column.

THE RESPIRATORY SYSTEM

The respiratory system includes the larynx, the windpipe, the two bronchi, and the two lungs. The larynx opens into the lower part of the throat and the nasal passages, or the mouth when it is open, before entering or after leaving the respiratory passages proper.

The larynx is adapted for voice production. It lies in the front of the neck, causing a more or less marked projection. It is superficially placed, being covered by the skin and slightly overlapped at the sides by the muscles and the lobes of the thyroid gland. It is composed of a framework of cartilages, joined together by membranes and ligaments, and to them a number of little muscles are attached, while the interior is lined with mucous membrane



The Larynx, Windpipe, and Bronchi.

The largest of the cartilaginous plates is composed of two wings which meet in front at an angle, except in the upper part, where they are separated by a deep notch, the apex of which projects in the neck and is popularly known as Adam's apple.

The epiglottis is a thin plate composed of fibro-cartilage which projects from the front of the larynx over the opening of the air-passage into the pharynx.

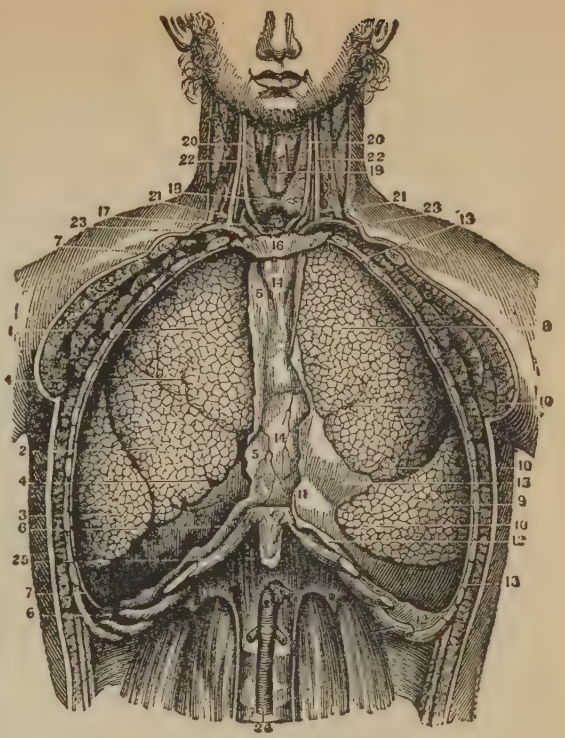
The interior of the larynx is lined by mucous membrane. The sides of its upper opening are formed by two sharp folds of mucous membrane. The back of the opening of the larynx is formed by the projecting epiglottis. The larynx itself is divided

into three parts. The upper part is wider than the opening above and narrows at the first pair of mucous membrane folds, the false vocal cords. The middle part consists of a narrow pocket between the upper and lower mucous membrane folds. The lower pair of mucous membrane folds are prominent and sharp, being the true vocal cords, composed of mucous membrane tightly stretched over underlying ligaments. The lower part of the larynx, below the vocal cords, leads directly into the windpipe.

Immediately below the larynx the windpipe is crossed by the isthmus of the thyroid gland, the lobes of which are closely applied to its sides. At each side of the windpipe in the neck is the common carotid artery, and at its lower part, at the left side, the arch of the aorta is in close relation, as are the great vessels which spring from the aortic arch, the innominate and the left common carotid being at first in front of the windpipe. In close contact with the whole length of the posterior aspect of the windpipe is the esophagus, which separates the windpipe from the bodies of the vertebræ.

The bronchi, into which the windpipe divides opposite the fifth thoracic vertebra, are two in number. The structure of the bronchi resembles that of the windpipe, rings of cartilage similarly keeping the tubes permanently open. The bronchi branch freely on all sides in the substance of the lungs, the smaller branches sending off still smaller branches, and as the air-passages become smaller the cartilages gradually disappear, and the muscle-fibers form a layer all round the passages.

The lungs are two in number, and are conical, spongy, vascular organs, situated one on each side of the thorax. Each is covered by the pleura, which is continuous at the root of the lungs with a similar membrane which lines the cavity of the chest, the space between the two membranes being termed the pleural cavity. On the right side it may be indicated on the surface by a line drawn from about an inch above the inner third of the collar-bone, and then vertically down to the level of the sixth costal cartilage. The line then passes obliquely downward and outward over to the junction of the eighth rib and the eighth costal cartilage; it crosses the tenth rib in the midaxillary line, and reaches the vertebral column at the level of the body of the twelfth vertebra. The posterior line of reflection follows the outer margin of the vertebral column.



Front View of the Lungs.

On the left side the line of pleural reflection corresponds to that of the right side as far as the fourth costal cartilage, where it passes outward and then descends to the sixth costal cartilage, afterward following approximately the same direction as the line of the opposite side, but slightly higher.

The surface marking of the right lung is practically the same as the line of pleural reflection as far as the sixth costal cartilage, although it does not quite meet that of the opposite in the sternal region, but thereafter the line passes much less obliquely outward at the level of the sixth rib, and reaches the vertebral column at lower border of the tenth vertebra. Posteriorly it is practically the same as the line of pleural reflection.

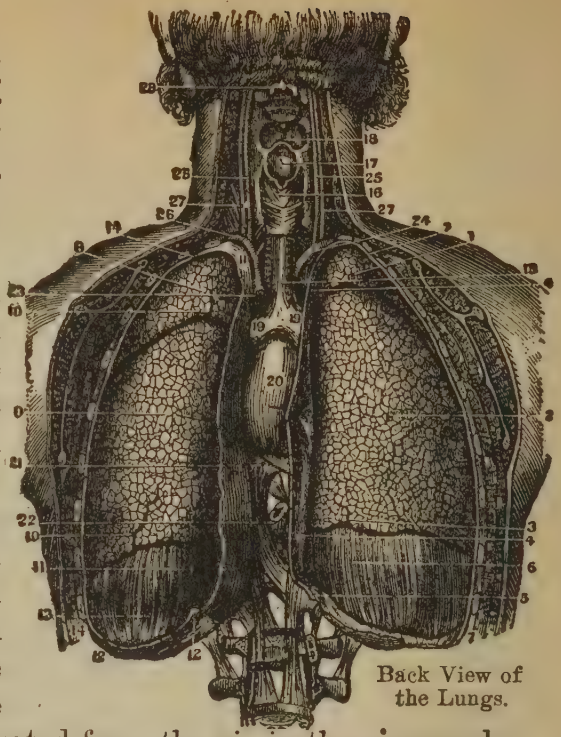
The surface marking of the left lung corresponds to that of the right as far as the fourth costal cartilage, when it passes outward along the lower border of the cartilage to a point about an inch and a half from the margin of the breast-bone; it then is directed obliquely downward to the fifth costal cartilage and turns inward to the upper border of the sixth costal cartilage, forming a larger notch; it then follows the same direction as on the other side.

The lungs are molded to the walls of the chambers in which they are situated, the outer aspects receiving the impressions of the ribs, while the under aspects are hollowed by the diaphragm. The right lung, in its inner aspect, is molded by the heart, which causes a slight depression in front. The left lung in its inner aspect has a deep depression in front molded by the heart, the bulk of which is, of course, on the left side.

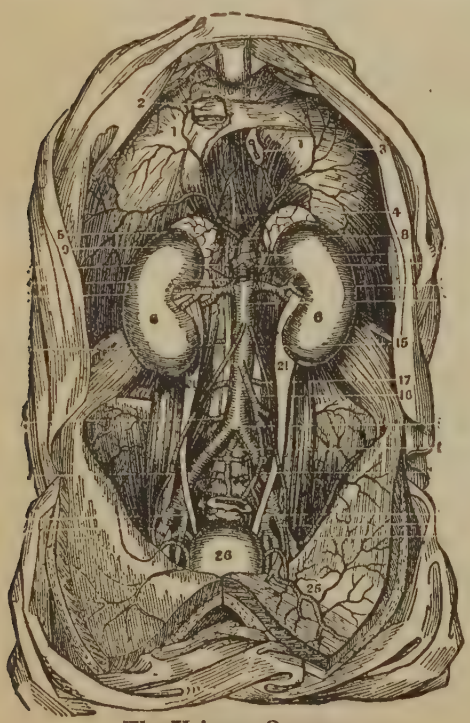
The left lung has in its substance deep fissures, and the right

lung has also a secondary fissure running horizontally from the middle of the greater fissure to the inner border of the lung; thus the left lung is divided into two and the right into three lobes.

Each lung is attached on its inner aspect to the wall of the pleural cavity, at the root, where the blood-vessels (pulmonary arteries and veins), bronchi, lymphatics, and nerves enter and leave its substance. The terminal branches of the bronchi end in irregular passages, from the sides of which go off the air-sacs. The blood in these capillaries is thus only separated from the air in the air-sacs by the light framework of the walls of the capillaries.



Back View of the Lungs.



The Urinary Organs.

THE URINARY SYSTEM

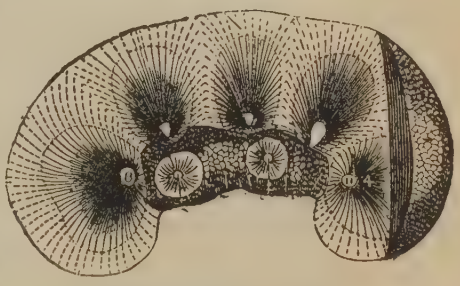
The urinary system comprises the kidneys, which secrete the urine; the ureters, a pair of tubes along which the urine passes from the kidneys to the bladder; the bladder, a reservoir for the urine, situated in the pelvis; and the urethra, a tube which conveys the urine from the bladder.

The Kidneys.—The kidney has a bean-shaped form, having a convex outer border and a concave inner border, with somewhat bulging extremities, while the color is a deep

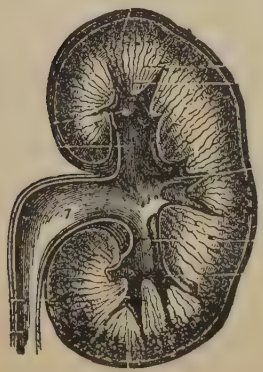
brownish red. The average length is rather over four inches, the breadth about two inches, and the thickness rather over one inch, the weight varying usually from about four to six ounces. There is a fissure in the concave inner border, termed the hilum, at which the ureter, the branches of the renal vein and artery, the lymphatics, and the nerves enter and leave the substance of the kidney.

The kidneys are situated in the upper part of the back of the abdominal cavity, one on each side of the vertebral column, usually above the level of the last rib. The posterior surface of the kidney is in relation above with the diaphragm, on the outer side with the abdomen. The kidney is in front of the transverse processes of the last thoracic and the first three lumbar vertebræ.

A tough fibrous coat, the capsule, envelops the exterior of the kidney, and if a longitudinal section is made through the organ, it is found to consist of two more or less distinct layers, the outer, which has a granular appearance, termed the cortex or bark, and the inner, which consists of a number of pyramidal striated masses with their apices projecting into the renal pelvis, termed the marrow. The substance of the kidney consists of a vast number of minute lengthy and complicated tubules, with which are associated numerous small blood-vessels. Each tubule starts in a cortex from a small dilatation into which projects a convoluted bunch of capillary blood-vessels. To each of these runs a minute artery which is a branch of an interlobular artery derived from a branch of the renal artery, and from each comes a vein which breaks up again into capillaries which supply the tubules.



Section of the Kidney.



7. Entrance of Ureter into Kidney.

The Ureters.—When the ureter enters the substance of the kidney, it dilates within to form a narrow funnel-like sac. The pelvis is lined with mucous membrane which is continuous with that of the ureter and the urinary bladder, and this sac acts as a pre-

liminary receptacle for the urine before it is conveyed to the bladder. The ureter is a narrow tube of comparatively thick walls, which conveys the urine from the pelvis of the kidney to the urinary bladder. The upper part of the ureter passes downward and inward behind the peritoneum and enters the pelvis, where the lower part of the ureter curves downward and inward on the side wall of the pelvis. In the male, the ureter then crosses over the seminal vesicle, in front of which it enters the bladder, while in the female it goes under the broad ligament of the uterus, lies on the outer side of the lowest part of the uterus, and then enters the bladder.

The Bladder.—The urinary bladder is a sac of muscular and membranous structure, serving as a reservoir for the urine, which it receives from the kidneys and the ureters, and expels from the body of the urethra. Its situation and its relations depend upon the amount of its distention; when empty, it lies entirely within the pelvis, but when distended it rises up into the abdomen.

When empty the bladder may be described as having a base, an apex, a superior surface, and two lower lateral surfaces. The base is presented backward and downward, and in the male is in relation to the seminal vesicles, and, in its lower part, to the prostate gland, while in the female it is in relation to the neck of the uterus, or womb, and the highest part of the vagina. At the front of the base is the neck of the bladder, where the urethra commences, to which the prostate gland is in close relation all around. The neck is attached to the pelvis by fibrous ligaments, but otherwise the bladder is freely movable, while behind it is supported by the rectum in the male, or the uterus in the female, and in front it receives support from the pad of fatty tissue behind the pelvis. The infero-lateral surfaces of the bladder are in relation to the pelvis, and the ureters enter the bladder at the upper angle where the infero-lateral surfaces join the base. The upper surface of the bladder is presented upward toward the pelvis, and is in relation to part of the colon and of the small intestine, which vary according to the distention of the bladder.

The walls of the bladder are composed of an incomplete outer coat of peritoneum, a middle coat of muscular tissue, and an inner or mucous coat, which is smooth when the bladder is dis-

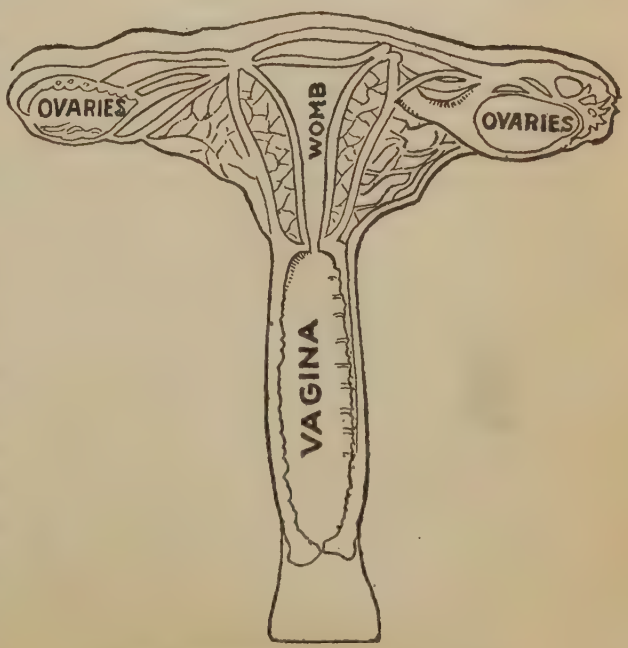
tended, but, being very loosely attached to the muscular coat, is greatly wrinkled when the bladder is empty.

The Urethra.—The urethra is the canal by which the urine is conveyed from the bladder to the exterior. In the male the ducts of the various glands of the reproductive system also open into the urethra. In the female the urethra is a short narrow canal about an inch and a half in length, directed downward and forward behind the symphysis pubis, and opening upon the surface by a small slit immediately in front of the anterior margin of the vagina.

THE REPRODUCTIVE SYSTEM

The reproductive system includes, in the male, the testicles, a pair of reproductive glands placed in the scrotum; the epididymis, the convoluted first part of the duct of the testicle; the vas deferens, the duct proper of the testicle; the seminal vesicles, a pair of receptacles for storing the semen, or secretion of the testicles, which join the lower parts of the corresponding vasa deferentia; the common ejaculatory ducts, the narrow terminal parts of the vasa deferentia, opening into the urethra, which conveys the semen to the exterior; the prostate gland and the two Cowper's glands, accessory glands opening into the urethra; and the external genital organs, the penis and scrotum.

In the female the reproductive system includes the ovaries, a pair of reproductive glands situated in the pelvis; the Fallopian tubes, which connect the ovaries with the womb; the uterus, or womb, in which the development and



The Female Reproductive Organs.

growth of the embryo and fetus from the ovum takes place; the vagina, the passage from the womb to the exterior; and the vulva, which includes all the external genital organs of the female. The mammary glands, or breasts, are also included.

The testicles are two in number, and are situated side by side in the scrotum. Each is oval in shape, about an inch and a half long, one inch broad, and three quarters of an inch thick, covered with a strong fibrous coat from which fibrous partitions go into the substance of the gland, dividing it up into compartments in which are, intricately coiled, the seminiferous tubules, where the spermatozoa, or male sexual elements, are formed.

The epididymis lies behind and in close relation to the testicles. It is a crescent-shaped body, the upper part of which is formed of a number of small twisted ducts coming from the testicles. These join together to form one tube, which is greatly convoluted and composes the body and the lower part of the epididymis.

The vas deferens is the continuation of this tube. It is at first also convoluted, but soon becomes straight and runs up from the scrotum, through the external and internal abdominal rings in the spermatic cord, down the side of the pelvis, crosses the ureter, and proceeds to the base of the bladder, where it becomes dilated, and then, after being joined by the corresponding seminal vesicle, narrows to form the common ejaculatory duct.

The seminal vesicles are two sacs, which are really tubes coiled upon themselves and held in a sac-like form by sense tissue. They lie in close relation to the base of the bladder and along the inner sides of the last parts of the vasa deferentia, into which they open.

The common ejaculatory ducts are two in number, and pass through the substance of the prostate gland and open into the prostatic part of the urethra.

The urethra is the tube, about eight or nine inches in length, which conveys to the exterior the urine from the bladder, and also the semen, or secretion of the testicles, from the vasa deferentia and the seminal vesicles. It may be considered as in three parts, the prostatic urethra, the membranous urethra, and the spongy urethra. The prostatic urethra is the first part of the tube, which traverses the prostate gland, and into it open the common ejaculatory ducts and the numerous small glands of the prostate. The spongy urethra is that part which is within the penis, and

is by far the longest of the three parts; it is contained in the corpus spongiosum of the penis, the two corpora cavernosa lying on each side above it.

The prostate gland is a cone-shaped structure, its length one and a quarter inches and its breadth slightly more, composed partly of glandular and partly of muscular tissue, and covered with a strong fibrous capsule. It lies below and behind the symphysis pubis, with its base in close relation with the lowest part of the urinary bladder, its apex pointing downward and forward, and its substance is traversed by the urethra and by the ejaculatory ducts from the seminal vesicles.

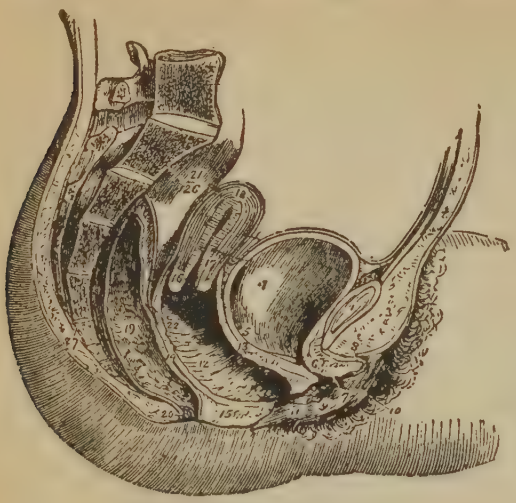
The penis is composed of three cylindrical masses of erectile tissue, covered with subcutaneous tissue and skin. Two of the cylindrical masses, the corpora cavernosa, are situated above, side by side, and one, the corpus spongiosum, in which the urethra runs, below, in the middle. At the root of the penis the two corpora cavernosa become thicker and more fibrous and are joined at each side to the arch of the pubis; while the corpus spongiosum enlarges to form the bulb. At the anterior part of the penis the corpus spongiosum enlarges to form the glans, which forms the whole part of the organ, and is covered by the foreskin. A fibrous ligament, the suspensory ligament, attaches the body of the penis to the front of the symphysis pubis.

The scrotum is the pouch in which the testicles are placed. Internally it is incompletely divided by a septum, each testicle lying within a serous sac, the tunica vaginalis, which is primarily derived from the peritoneum of the abdominal cavity.

In the female, the ovaries are two in number, almond-shaped and about an inch in length, situated one on each side within the pelvis, and joined by short folds of peritoneum to the broad ligaments which attach the womb to the sides of the pelvis; a definite musculo-fibrous ligament also attaches the inner end of each ovary to the upper angle of the womb. Embedded in the fibrous tissue of the substance of the ovary are little masses of cells from which the follicles develop and gradually make their way to the surface. When a follicle is ripe it bursts upon the surface, and an ovum, the female sexual element, is set free.

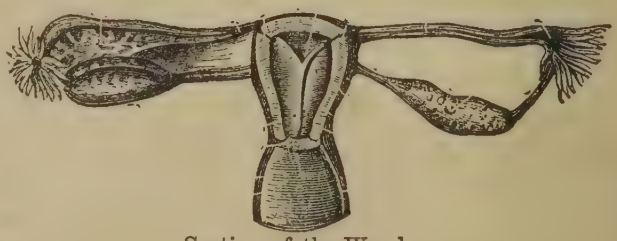
The Fallopian tubes lie one on each side of the upper borders of the broad ligaments, and serve to convey the ova from the ovaries to the womb, into the upper angles of which they open.

The distal end of each tube has in it a small opening into the peritoneal cavity of the abdomen, and has fringes, or fimbriæ, hanging from it, the largest of them being attached to the ovary.



Side View of the Female Reproductive Organs.

The uterus, or womb, is a pear-shaped, muscular, hollow organ, about three inches long, two inches broad at its wider part, and nearly one inch thick, in the non-pregnant condition. It is usually described in three parts, the fundus, or upper rounded part; the body, rounded and continuous with the fundus, gradually diminishing in breadth, and marked off by a slight constriction from the cervix, which is the lowest part of the womb, narrower and more cylindrical than the body. The cervix presents into the vagina a knob-like, rounded, lower extremity, in which is a minute opening in the middle of a central dimple on the surface. The walls of the womb are very thick in comparison to its internal cavity, which is practically a triangular slit placed laterally, the anterior and posterior walls being almost in contact, and it is lined with smooth mucous membrane. The lower part of the cavity, the cervical canal, is wider in the middle than above and below, the mucous membrane of its walls being thrown into a series of folds.



Section of the Womb.

From each side of the womb the broad ligaments, formed of a double layer of peritoneum, go out to the walls of the pelvis. To them are attached the ovaries, and they contain several important structures, including the Fallopian tubes and the muscular round ligaments, which proceed forward on each side to the inguinal canal and end in the subcutaneous tis-

sues; these ligaments have an important share in holding the womb in position.

The vagina is the passage, about three inches in length, directed downward and forward, which leads from the womb to the exterior. Its walls are muscular and it is lined with mucous membrane, its lower end being incompletely closed in the virgin by a fold of mucous membrane termed the hymen.

As the genital organs are not developed until maturity, and as the child has to pass through this bony framework, it is injudicious for girls to marry and have children before they have attained their growth; the proper age being from nineteen to twenty-five. Menstruation is considered the sign of ovulation, although it is probable that ripened ovules are thrown off at other times during the month, and it is possible for impregnation to take place at any time, although most likely to occur just before or just after menstruation. The spermatozoa, or living elements of the male, by means of the waving action of their tails, force themselves up through the uterus and Fallopian tubes until a ripe ovule is reached. This they penetrate, and become dissolved, and, as a result, the changes in the ovule take place. It is not at all necessary to impregnation that there should be penetration on the part of the male, as virgins have become pregnant who have allowed men to take liberties with them, without an entrance having been effected, the spermatozoa being deposited on the external parts.

The vulva includes all the external genital organs of the female, and includes the mons veneris, the fatty pad covered with hair in front of the pubis; the labia majora, the folds of skin extending at each side from the mons veneris almost to the anus, and representing the scrotum of the male; the labia minora, a pair of smaller folds of mucous membrane lying internal to the labia majora, inclosing the clitoris in front; the clitoris, which is the representative of the penis of the male, composed like it of erectile tissue, and the most sensitive part of the female genital organs; and the urethral orifice, which is a puckered opening just in front of the anterior margin of the vagina and about an inch behind the clitoris.

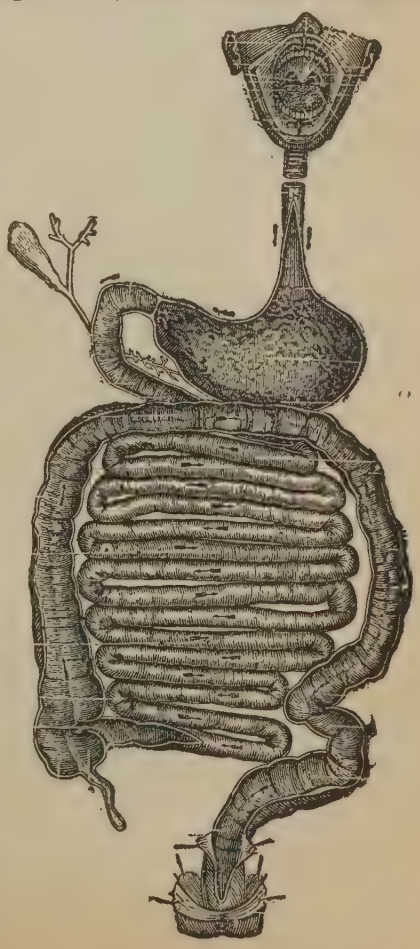
The mammary gland, or breast, is the gland in the female which secretes milk and by means of which the young are suckled, being present in the male only in a rudimentary form. The mam-

mary glands are two in number, and are situated in front of the chest, where they form symmetrical prominences of greater or less degree, extending in the adult from about the third to the seventh rib. In the center of the surface of the gland is a darker patch of skin, the areola, from which arises a conical projection, the nipple. The gland is composed of about a score of lobes arranged in a circle, branching to form smaller lobules, bound together with connective tissue and embedded in fat, which forms the chief bulk of the breast. From each lobe proceeds a duct which opens on the apex of the nipple. The mammary glands become considerably enlarged during pregnancy, and very shortly after the birth of the child milk begins to be secreted.

THE DIGESTIVE ORGANS AND THEIR DISEASES

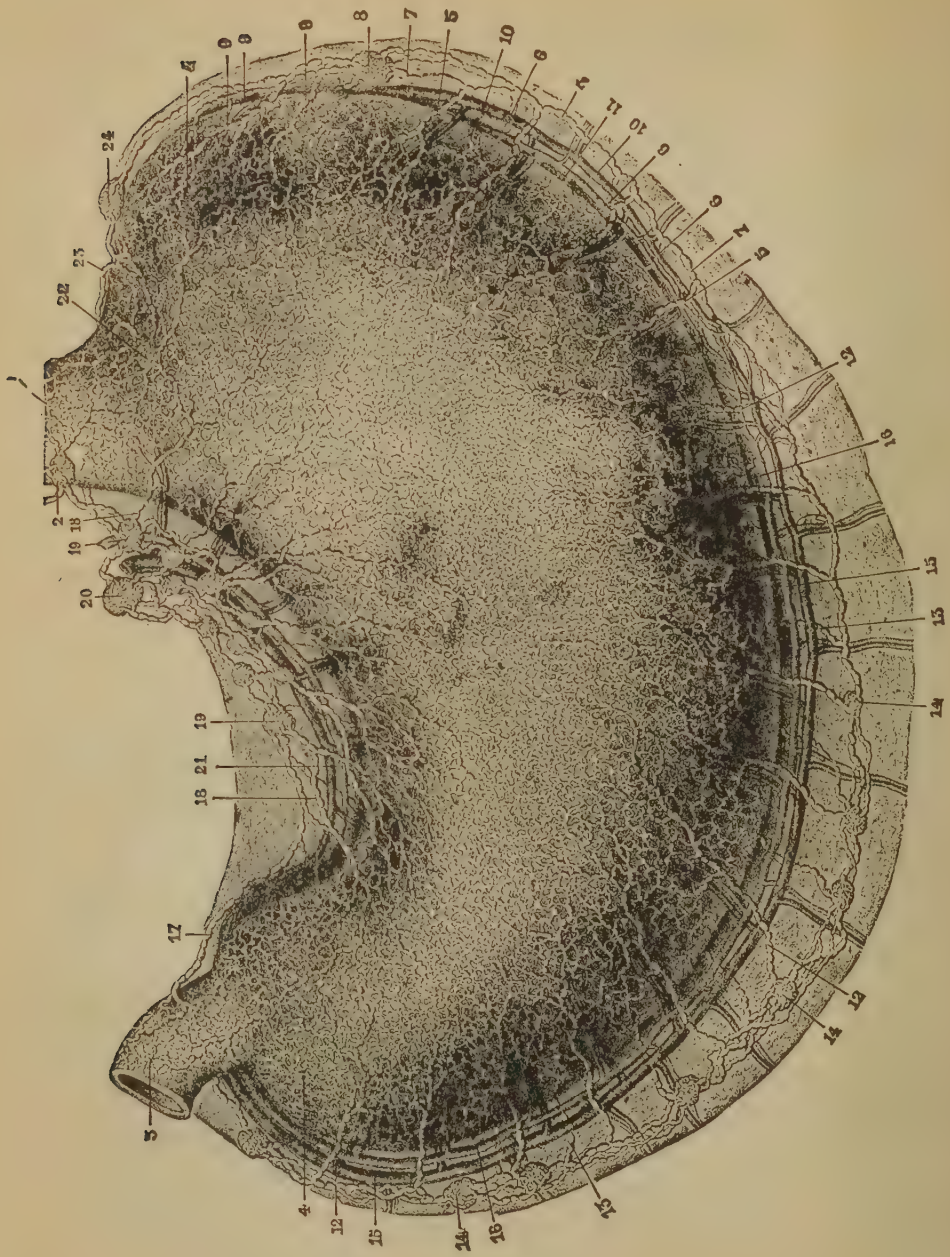
THE STOMACH

DEFINITION.—The stomach is a dilated portion of the alimentary canal, which in man has a shape somewhat resembling that of a pear. The larger end, known as the fundus, lies in the hollow of the left side of the diaphragm, and at one side of this is the opening from the gullet. The greater part of the stomach, into which the gullet opens, is known as the cardiac part, while the lower and narrower portion is known as the pyloric part. The two openings into and out of the stomach are known as the cardia and the pylorus. The stomach is slightly flattened from before backward, and the two edges are known as the lesser curvature, which runs from one opening to the other direct, and the greater curvature, which sweeps round the fundus from the cardia to the pylorus.



Size and Position.—The stomach hangs very freely suspended in the upper and left part of the abdomen, so that changes in its position and shape take place readily according to the

THE LYMPHATICS OF THE HUMAN STOMACH



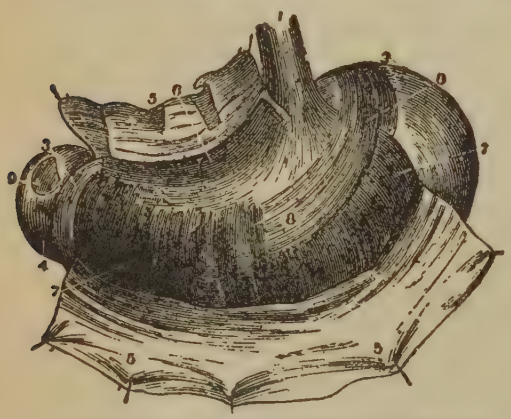
EXPLANATION OF PLATE

THE LYMPHATICS OF THE HUMAN STOMACH

1. Gastric end of the esophagus.
2. Lymphatic gland receiving part of the lymphatics of the esophagus; its efferent vessels extend to the glands around the coronary blood-vessels and there join those from the stomach.
3. The beginning of the duodenum.
4, 4. Fine network of lymphatic vessels in the muscle; from this fine network arise all the collecting trunks of the muscular coat.
5, 5, 5. Lymphatic trunks on the left part of the great curvature.
5, 5, 6, 6. Lymphatic vessels from the upper and lower surfaces of the left third of the great curvature.
7, 7, 7. The principal trunk encircling the left half of the great curvature of the stomach; it receives the branches from the stomach and extends toward the left to enter a large gland (8) situated near the tail of the pancreas and the center of the spleen.
8. Gland at the left of the stomach near the center of the spleen; it receives trunks from both directions, also some from the spleen.
9. Trunks from the extreme left of the stomach to the gland marked 8.
10. Left gastric vein.
11. Left gastric artery.
12, 13. Trunks from the upper and lower aspects of the pyloric region.
14, 14, 14. The chain of glands on the right along the great curvature; through these pass all the lymphatics from the half next the greater curvature; the efferent trunks from these glands finally extend to the glands at the head of the pancreas; all the glands in the chain around the great curvature are sometimes designated as the lower lymphatic glands of the stomach, and they lie in the great omentum and form part of the celiac lymphatic plexus.
15, 16. Upper right gastric vessel.
17. Trunk from the duodenum and the pylorus to the glands along the lesser curvature.
18, 18. Trunks extending to the lesser curvature.
19, 19. The lymphatic glands along the gastric coronary vessels in the lesser curvature; they receive all the so-called ascending trunks from the stomach and some of the trunks from the esophagus, and form part of the celiac lymphatic plexus.
20. The large celiac gland to which the efferent vessels from 19 extend.
21. Coronary vessels of stomach.
22. Gland, often double, on the upper aspect of the cardia.
23. Large trunk winding round the cardia and joining the trunk to 22 and 24.
24. Gland, sometimes double, at the extreme left of the great curvature.

amount of food it contains. On the surface, the stomach corresponds to the ribs on the left side from about the fifth to the ninth, and extends below their protecting margin about half-way down to the navel. The fundus lies immediately below the heart and base of the left lung, separated from them only by the diaphragm and their enveloping membranes. This explains the embarrassment of the heart's action and of breathing sometimes experienced by dyspeptics.

In many individuals, however, especially of the tall, slender type, the stomach occupies a lower position in the abdomen. In cases of extreme ptosis, the entire organ may be below the level of the navel. The stomach is attached at the cardiac opening to the gullet, and at this point it is further secured to the diaphragm by a ligament. A broad band of peritoneum (small omentum) attaches the lesser curvature to the under surface of the liver, and a similar peritoneal fold unites its hinder surface to the spleen. The pyloric end, like the cardiac opening, is to a great extent fixed in position, but the greater curvature is quite freely movable.



A Front View of the Stomach, distended, with the Peritoneal Coat turned off

1. Anterior Face of the Esophagus.
2. The Cul-de-Sac, or greater Extremity.
3. The lesser or Pyloric Extremity.
4. The Duodenum.
5, 5. A portion of the Peritoneal Coat turned back.
6. A portion of the Longitudinal Fibers of the Muscular Coat.
7. The Circular Fibers of the Muscular Coat.
8. The Oblique Muscular Fibers, or Muscle of Gavard.
9. A portion of the Muscular Coat of the Duodenum, where its Peritoneal Coat has been removed.

The greatest length of the stomach from the fundus to the greater curvature near the pylorus is about one foot, and the greatest breadth does not exceed four to five inches. The capacity varies greatly in different persons. The average person becomes very uncomfortable when more than two or three pints of fluid are poured into his stomach.

Structure.—The stomach possesses four coats similar to those of the intestine, which are, from within outward, a mucous

membrane, submucous layer, muscular coat, and a peritoneal coat.

Mucous membrane lines the interior of the stomach and is of smooth, soft texture, though raised up into ridges when the stomach is empty. The surface can be seen with the naked eye to be thickly covered by minute pits into each of which several tube-shaped glands are found, on microscopic section, to open. The mucous membrane in fact consists almost entirely of these glands placed side by side, and supported by a small quantity of connective tissue and by fibers of unstriped muscle. The surface of the mucous membrane is composed of a single layer of columnar cells, and these also line the pits referred to above. Each gland is composed of large cubical cells arranged so as to form a tube, open at the upper end where it meets the pit and closed beneath. These cells secrete the gastric juice which exudes from all the minute tubes as digestion is proceeding. In the cardiac end of the stomach there are other large cells in addition, mingled with those just described, and the large cells are supposed to secrete the acid of the gastric juice. Between the tubular glands lies some supporting connective tissue in which run numerous blood-capillaries and lymph-vessels.

Submucous coat is a loose connective tissue layer which joins the mucous coat to the muscular coat, and in which the large blood-vessels of the stomach run. The loose arrangement of its fibers allows the mucous membrane to glide freely over the muscular coat in the movements and variations in size of the stomach.

Muscular coat is of considerable thickness in the stomach, and is of great importance in varying the size of the organ according to the amount of food it contains, in making the "peristaltic" movements which mix the food with the digestive juice, and finally in expelling the softened food from the stomach into the small intestine. This coat consists of three layers: an outer one in which the fibers run lengthwise, a middle one where they are circular, and an inner layer in which they run obliquely across the stomach.

Peritoneal coat is similar to the peritoneum covering the other organs of the abdomen.

Vessels.—The stomach is abundantly supplied with blood from the celiac axis, a short, wide artery, which comes directly from

the aorta and likewise gives branches to the liver, pancreas, and spleen. There is a large arterial arch round either curvature, and from these two arches smaller branches run into the wall of the stomach and reach the submucous coat, from which minute branches are distributed to the other coats. The blood is collected by veins which ultimately return it to the portal vein.

Nerves.—The stomach is very richly supplied with nerves both from the brain and from the sympathetic system. The tenth cranial nerve (vagus) of each side has a long course down the side of the gullet, and after giving branches to the larynx, heart, lungs, and other organs, terminates in the stomach, which has therefore important nervous connections with these vital organs. Other branches come from the solar plexus of the sympathetic. These nerves form a plexus in the submucous coat and another in the muscular coat, which undoubtedly exert a powerful influence over the secretions and movements of the organ, though these functions are, in the main, carried out automatically.

A View of the Interior of the Stomach and Duodenum, the inferior portion of each having been removed.

1, 1. The under side of the Liver.
2. The Gall Bladder.
3, 3. The lesser Curvature and anterior Faces, as seen from below.
4. The Rugæ, about the Cardiac Orifice.
5. The Pyloric Orifice.
6. The Rugæ, and thickness of this Orifice.
7, 7. The Duodenum.
8. Lower End of the Right Kidney.

Functions of the Stomach.—The part played by the stomach in digestion consists in storing, warming, and softening the food, and then in passing it on in small quantities to the intestine, where the more important digestive processes that prepare it for absorption take place. The action of the muscular coat of the stomach is also very important. In birds, which have no teeth, the gizzard is a powerful muscular organ that grinds down the grain and other food into a pulp, but, in man, the muscular action is much gentler. This, together with other facts regarding the stomach, was first carefully observed about 1847 by Beaumont in the case of a man named Alexis St. Martin, whose stomach had been so exposed by a gunshot wound that a large opening existed, through which its interior could be inspected. The

movements, as seen now by the X-rays, consist of a series of waves, each of which takes about half a minute to pass along the stomach. These movements have also the effect of separating the more fluid parts from lumps still left in the later stages of digestion, which are retained in the cardiac part of the stomach, while the pylorus relaxes as each wave reaches it to allow some of the softened mass to pass through into the small intestine. This muscular movement takes place in health without causing any sensation, but in irritable conditions of the stomach, when digestion is not proceeding naturally, it may increase in force and give rise to irregular spasms which come and go, and which are attended by much pain.

DISEASES OF THE STOMACH

Only the more common and serious varieties of gastric disease can be here referred to. The majority of them exhibit, as their most marked and sometimes their only feature, the symptoms of "dyspepsia." Hence the diagnosis of the forms of stomach disease is frequently a matter of much difficulty. We here refer in general terms to the most prominent features which usually characterize the chief gastric disorders.

The stomach is liable to inflammatory affections, of which the condition of catarrh, or irritation of its mucous membrane, is the most frequent and most readily recognized. This may exist in an acute or a chronic form, and depends upon some condition, either local or general, which produces a congested state of the circulation in the walls of the stomach.

DYSPEPSIA

Definition.—Dyspepsia means pain, or any uncomfortable symptom associated with the function of digestion. The term dyspepsia should not be limited to the occurrence of pain while the food remains in the stomach, for this period represents only a small part of the digestive process, and interference with this process, in its wider sense, may produce various symptoms, such as appendicitis, constipation, diarrhea, upon which information will be found elsewhere. Vagaries of digestion produce symptoms of many sorts, often not at all directly connected with the

taking of food, and the whole subject is a most recondite one. The condition of the teeth is of the utmost importance in regard to dyspepsia, particularly those forms grouped as nervous dyspepsia, and proper chewing of the food, together with leisurely eating of meals by those accustomed to hurry, frequently suffices to cure indigestion of long standing. Success in treatment of obstinate cases is greatly aided by the administration of test meals, their withdrawal after some time by the stomach tube, and chemical and microscopic examination of the digestive products.

Acid Dyspepsia is one of the commonest forms. It is of several types, but as a rule affects young persons or those in the prime of life, and is due to the presence of an excessive amount of hydrochloric acid, or of acid salts, in the gastric juice. One type affects young persons of sedentary occupation, who eat irregularly as to time and amount of food, and who are in the habit of "bolting" their meals. Another type of sufferer is a girl the subject of anemia, in whom the acid dyspepsia is very frequently a forerunner of gastric ulcer. Still another type of sufferer is that of a nervous, highly strung individual, in whom nervous dyspepsia may take this form.

Symptoms.—As a rule, the sufferer is conscious of irregularity in taking his meals, and, having a good appetite, eats at times more food than is good for him. There is no discomfort for perhaps an hour, indeed relief is often gained by eating, and then a sense of heaviness and heat about the pit of the stomach and left side sets in and grows gradually worse. There is often a feeling as of strangling in the throat, and a vague sense of constriction in the left side which grows now more and now less intense in conformity with the muscular action of the stomach. Relief is got for a few seconds by swallowing saliva, and by gulping mouthfuls of air, but these lead later only to distention and greater pain. After perhaps an hour of this discomfort, a burning feeling (heartburn) is experienced about the center of the chest, and mouthfuls of intensely sour material are brought up into the mouth, leaving a raw feeling in the throat. Now and then vomiting occurs, and this gives temporary relief. The vomit is intensely sour, and may contain streaks of blood in cases where the pain is great, the blood and pain being due to minute erosions in the mucous membrane of the stomach. If

blood comes in any quantity, however, and if sharp pain be experienced immediately upon partaking of solid food, the case is probably one of ulcer.

Treatment.—Regularity in meal times, and in the amount of food taken at each meal, is essential, and regular exercise in the open air, cold baths in the morning and early rising all play an important part.

The symptoms may be much abated by powders containing rhubarb (two grains), soda (six grains), and carbonate of bismuth (twenty grains), taken half an hour after meals, or by a soothing mixture before meals. Constipation should be treated by mild remedies.

The following remedies will be found extremely helpful:

℞ Fluid Sweet Cascara .....one ounce
Rhubarb and Soda Mixture .....two ounces
Mix:
Dose: One teaspoonful in a wineglass of water, half an hour after each meal.

Or:

℞ Cream of Tartar .....two ounces
Dose: Half a teaspoonful with a swallow of water, after every meal.

Diet.—The food should be chewed deliberately, and small meals, frequently taken, suit this and the following form of dyspepsia better than large meals with long intervals. It is important to avoid condiments, such as vinegar, mustard, pickles, and particularly salt. The food should be of a simple form, which does not stimulate the walls of the stomach to secrete much gastric juice, such as eggs, fish, thick soups, puddings made from tapioca, corn-starch, rice, and the like. Above all, milk and cream are well borne, and, in any case where there is bleeding, should form the staple of the diet. Meat, meat essences, and strong (stock) soups should be avoided.

NERVOUS DYSPEPSIA

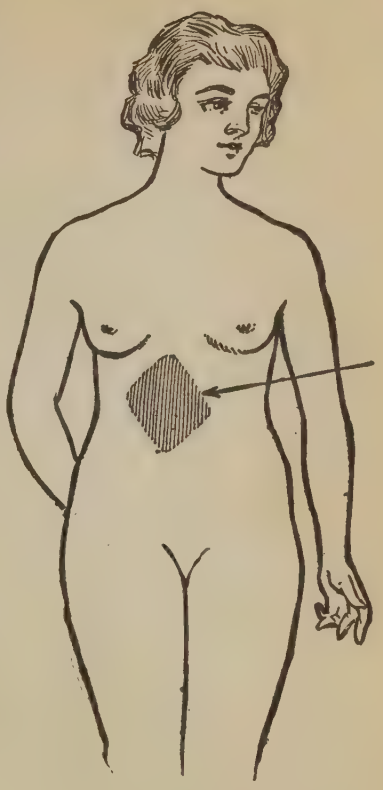
Definition.—Nervous dyspepsia includes many forms, the cases being due, not to an actual organic deficiency in or injury to the stomach, but to an exaggerated influence of the nervous system

in increasing or diminishing the natural movements of the digestive organs, or altering the character of their secretions.

Causes.—There may be no apparent cause for the dyspepsia beyond the fact that the person is of a nervous temperament, or there may be trouble in other organs, and particularly in women in the womb or ovaries, or the nervous system may be temporarily excited or worn out. These forms of dyspepsia occur also in alcoholics, in brain-workers, and in people subject to constant exhaustion, and are liable to be associated with mental depression and the moody critical state known as hypochondriasis.

Symptoms.—*Acute dilatation* arises readily in some people when food is taken during exhaustion, such as that caused by a long walk or climbing a mountain, or too soon after a severe surgical operation. The stomach distends, and can neither digest nor expel its contents. Ineffectual attempts are made at vomiting, and unless the stomach be relieved of its contents by a smart emetic or by the stomach-tube, the result may be dangerous even to life. *Periodic vomiting* is a similar but slighter condition which comes on now and then in people with irritable stomach, prone at other times to suffer from acid dyspepsia. It is known also as "acute catarrh," and as "bilious attack." Digestion ceases for the time being, and the stomach contents, often followed by bile from the intestines, are vomited up. It is due usually to an indiscretion in diet, and in women is sometimes associated with irregularity of the menstrual function. *Atonic dyspepsia* is a chronic condition which is practically the reverse of acid dyspepsia. The secretion of juice may fail, or the stomach walls may lose their activity and lapse into a weak, flabby condition of partial dilatation. It occurs especially in people of feeble general health, for example, in consumptives, or is sometimes the result of long-continued abuse of the stomach by overfeeding. *Spasm* is an acute condition of the opposite nature. It comes on from time to time, often associated with acid dyspepsia, and causes severe griping pains very similar to colic. *Flatulence* is a condition which may be due either to fermentation in the intestine or to nervous influences. Persons subject to it are troubled by noisy action of the stomach and bowels, particularly when the limbs are at rest, and are liable to suffer from cold hands and feet, warm and cold flushes, and other signs of bad circulation.

Treatment.—Atonic dyspepsia requires tonics, the use of nutritious food of little bulk, change of air and scene, and cold baths. Spasm is relieved by hot compresses, mustard plaster to the pit of the stomach as indicated by the shaded area in the accompanying figure, and internally antipyrine (five grains), chloroform-water (a tablespoonful), or tincture of valerian (twenty drops on sugar). Flatulence requires simple food, an avoidance of certain articles of diet, such as green vegetables, and general tonic treatment.



℞ Tincture of Valerian
two ounces
Bromide of Sodium
half ounce
Chloroform-water
one ounce
Mix.
Dose: One teaspoonful in a little water, half an hour before each meal.

Or:

℞ Phenacetine and Salol .....five-grain tablets
Dose: One to be taken every three hours for three doses.

Treatment, to be effective, must be carried out earnestly and persistently, and should mainly consist of avoidance of excitement and mental work, freedom from worry, open air, cold baths followed by friction with a heavy, rough towel—or better, a brush. If the patient is delicate, anemic and exhausted, then the "rest cure" is indicated in preference to the above.

The diet should be readily digestible, consisting largely of milk, buttermilk, eggs and cereals.

The following tonic is excellent:

℞ Elixir Iron, Quinine, and Strychnine .....four fluid ounces
Dose: One teaspoonful in a little water, before meals.

FERMENTATIVE DYSPEPSIA

Definition.—Fermentative dyspepsia is a very definite condition, which, however, is far less common than those already stated. It arises in connection with dilatation of the stomach due to some obstruction at its exit, in consequence of which food is retained, ferments, and distends the organ. In the majority of cases the gastric juice is not deficient.

Causes.—The most common cause is narrowing of the outlet by the scar of a previous and healed ulcer, while other causes are found in various displacements of the organ, pressure by other organs such as a floating kidney, and even tumors in the stomach wall.

Symptoms.—Great loss of appetite, a feeling of constant fullness and weight increased by food, belching up of foul-smelling gases, repeated vomiting of large quantities of fermenting, frothy, half-digested food, great thirst, headache, and obstinate constipation are the main symptoms of this form of dyspepsia.

Treatment.—The washing out of the stomach, regularly, for a period of some weeks, either at night or in the morning, is the treatment *par excellence* of this condition. After having been shown a few times how to pass the stomach-tube, the patient can easily do this for himself, and thereby obtain great relief.

The apparatus required for washing out the stomach is: a soft india-rubber stomach-tube about two feet long; a glass tube three inches long to connect it with five feet of rubber tubing; and a glass or metal funnel to fit into the other end of the long piece of tubing. The method of use is as follows: the stomach-tube is dipped in ice water and the end is then passed back into the throat; swallowing motions are at once made by the patient while the tube is pushed steadily onward for a distance of eighteen or twenty inches, by which time its end will have reached the stomach. If an inclination to retch be present, it is obviated by drawing deep breaths. Fluid is then poured into the funnel, and this being raised, the fluids runs down into the patient's stomach. Before the tube is quite empty the funnel is depressed into a pail or other receptacle standing on the floor, and the fluid, and other contents of the stomach, run off by siphon action. This is repeated till several quarts of fluid

have been run into and out of the stomach, thoroughly cleansing its walls. The fluid employed is generally warm water containing two teaspoonfuls of bicarbonate of soda to the pint. The patient, though he may find the process disagreeable at first, speedily loses any feeling of discomfort, and soon learns to pass the tube himself.

If the patient cannot tolerate having the stomach washed out, Carlsbad salt may be used before breakfast, or the stomach may be cleansed by sipping a glass of hot alkaline water, one hour before meals.

When the condition of dilatation is great and does not yield to simple treatment, the operation of gastro-enterostomy—by which an opening is made out of the lowest part of the stomach into a neighboring loop of the small intestine—is sometimes helpful in cases of dilatation caused by narrowing of the scar following an ulcer.

The following formulas will prove efficacious:

℞ Hydrochloric Acid .....two teaspoonfuls
Essence of Pepsine .....three ounces
Mix.
Dose: One teaspoonful in a wineglass of water, one hour before each meal.

Or:

℞ Bicarbonate of Soda.one and one-half teaspoonfuls
Compound Infusion of Gentian....six fluid ounces
Mix.
Dose: One tablespoonful fifteen minutes before meals.

Diet.—Further, a special diet is necessary. The dyspeptic should avoid fats and starchy foods, take all his nourishment in as dry a form as possible, eat only three meals daily, with no food between them, and limit the fluid he drinks to a quart or less each day.

VOMITING

Definition.—Vomiting means the expulsion of the stomach contents through the mouth. When the effort of vomiting is made, but nothing is brought up, the process is known as retching. When vomiting occurs, the chief effort is made by the muscles of the abdominal wall and by the diaphragm contracting together and squeezing the stomach. The contraction of

the stomach wall is no doubt also a factor, and an important step in the act consists in the opening at the right moment of the cardiac or upper orifice of the stomach. This concerted action of various muscles is brought about by a "vomiting center" situated on the floor of the fourth ventricle in the brain.

Causes.—Vomiting is brought about by some irritation of this nervous center, but in the great majority of cases this is effected through sensations derived from the stomach itself. Thus, of the drugs which cause vomiting some act only after being absorbed into the blood and carried to the brain, though most are irritants to the mucous membrane of the stomach; dyspepsia also acts thus, and lies at the root of most sick-headaches; and various diseases of the stomach, such as chronic catarrh, cancer, ulcer, and dilatation, act in a similar way. Irritation, not only of the nerves of the stomach, but also of those proceeding from other abdominal organs, produces vomiting; thus in obstruction of the bowels, peritonitis, gallstone colic, renal colic, and even during pregnancy, vomiting is a prominent symptom.

Strong impressions of an unpleasant nature made upon the nerves of sense are very apt to produce vomiting. Thus an offensive smell, a disagreeable sight, any interference with the balancing sense, as in sea-sickness, irritation or even tickling of the throat, and the pain of an injury or operation, are all likely to be attended by vomiting.

Direct disturbance of the brain itself is naturally a cause, and often a very obscure cause, of vomiting; for example, a blow on the head, a cerebral tumor or cerebral abscess, meningitis, locomotor ataxia, and nerve-storms like migraine. Many cases of hysteria also show attacks of vomiting as one of their prominent symptoms.

Finally, the vomiting center may be brought into action by various poisons introduced into the blood, like tartar emetic; or by the poisons of various acute and chronic diseases, such as Bright's disease, smallpox, scarlet fever, typhus, and cholera. Vomiting, indeed, forms an important early symptom of these diseases.

Characters of the Vomit.—*Food*, more or less softened and made sour and bitter by digestion, constitutes the vomit in the simpler cases, such as those due to emetics, sea-sickness, bad smells, etc. It should be remembered that when milk is vomited

up curdled, this indicates simply that the first step in its digestion has taken place, and it is a mistake to conclude, as is often done, that the curdling indicates some intolerance of the stomach for milk.

Watery fluid, brought up irrespective of meals, forms the vomit in nervous conditions; in weak states, for example, in the vomiting of bloodless persons, and at an early stage of pregnancy. When the vomiting continues long, it tends to bring up mucus and bile also.

Mucus, when vomited in considerable amount in strings, and especially when sour in taste and brought up in the morning, is a sign of catarrh of the stomach, particularly that form associated with constant indulgence in alcohol.

Bile may be brought up by any long-continued attack of vomiting, after the contents of the stomach have been expelled and retching still continues, for example, in sea-sickness, or in migraine and other forms of nervous vomiting. Usually the bile is golden-yellow in color; but sometimes it is a grass-green, and this generally indicates a serious condition, such as peritonitis or obstruction of the bowels. The seriousness of the condition producing the vomiting is still more assured when the ill-smelling, brownish contents of the bowels follow after the bilious vomit.

Frothy material, with a yeasty smell, which divides into three distinct layers, viz., froth on the surface, and a sediment of undigested food, with a layer of clearer fluid between, is highly characteristic of the vomit from a dilated stomach in which fermentative dyspepsia is taking place.

Blood may be red in color, and brought up mixed with the food or in clots; but, much more frequently, it is vomited as a brown granular material, very much resembling coffee-grounds. As a general rule, the vomiting of blood indicates some ulceration in the interior of the stomach, but the amount of blood is no guide to the size of the ulcer, because serious bleeding sometimes occurs from hardly perceptible "erosions" of the mucous membrane.

Treatment must have two objects in view: (1) to relieve the source of the irritation, and (2) to soothe the nervous center.

In the first place, the cause of the vomiting must be sought for, and in general this will be found to be some disorder of the

stomach. If an indigestible meal has been taken some time previously, and its remnants are still loading the stomach, an emetic or a copious draft of warm water has the effect of getting rid of the indigestible material and allowing the irritation to subside. Various substances which have a soothing action upon the stomach may also be taken when the sickness continues, such as carbonate of bismuth, or a powder composed of rhubarb (two parts), soda (two parts), and bismuth (four parts), in teaspoonful doses, or a tablespoonful of chloroform-water. The application of some counter-irritant, such as a mustard plaster, over the pit of the stomach, has often a very marked sedative effect. In irritable stomach conditions, posture is an important matter; the sufferer should lie with the head on a low pillow, and on his left side, so that the stomach is supported by the ribs.

The vomiting due to such serious conditions as peritonitis subsides under the treatment appropriate to these conditions, and when nothing can be retained in the stomach, the sucking of small lumps of ice often gives great relief.

Vomiting due to inflammation or some other source of irritation in the throat is greatly relieved by soothing gargles, or by sucking lozenges containing ammonium chloride or chlorate of potash.

Fresh air is of great importance, and the drawing of deep breaths has a distinct effect in checking the tendency to vomit. Mental quiet and a darkened room also assist in soothing the nervous system.

Below are formulas useful in different conditions:

1. Nervous vomiting:

℞ Menthol .....one grain
Bicarbonate of Soda .....one and one-half drams
Mix, and put in ten capsules.
Dose: One capsule three times a day.

2. Vomiting due to acute gastric and intestinal disorders:

℞ Phenol .....five grains
Bismuth Subnitrate .....two drams
Mucilage of Acacia .....one fluid ounce
Peppermint-water .....three fluid ounces
Mix.
Dose: One tablespoonful every three hours.

3. Vomiting of pregnancy, ulcers of stomach, or morning vomiting caused by intoxication:

℞ Fowler's Solution .....two fluid drams
Dose: One drop in water, three times a day.

4. Vomiting caused by hyperacidity of stomach:

℞ Lime-water .....four fluid ounces
Dose: One tablespoonful every two hours.

5. Vomiting of pregnancy and bilious vomiting:

℞ Carbolic Acid .....two grains
Chloroform .....five drops
Simple Syrup .....thirty fluid drams
Water .....thirty fluid drams
Mix.
Dose: Two teaspoonfuls every two hours. Give two teaspoonfuls of water between doses from time to time.

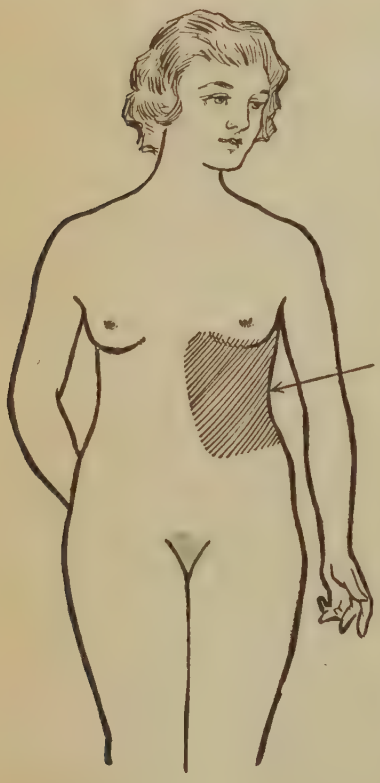
ACUTE GASTRITIS—ACUTE CATARRH OF THE STOMACH

Causes.—Of these the most important are: (1) constitutional conditions, such as the gouty or rheumatic, or an inherited tendency to irritability of the digestive organs; (2) errors in diet, particularly excessive quantity, indigestible quality, imperfect mastication, extremes of temperature of the food, poisonous agents, especially alcohol in excess, or food in a state of decomposition; (3) atmospheric influences, as appears evident from its tendency to occur in very warm or very cold weather or in the case of sudden temperature alternations; (4) a nervous type of this acute form of irritation also exists and the condition is apt in many persons to come on periodically; and (5) by direct infection of the stomach from pyorrhea and infections of the nose and throat.

Symptoms.—The chief change the stomach undergoes affects its mucous membrane, which is in a state of congestion, either throughout or in parts. The symptoms are those well known as characterizing an acute "bilious attack," consisting in loss of appetite, sickness or nausea, and headache, frontal or occipital, often accompanied with giddiness. The tongue is furred, the breath fetid, and there is pain or discomfort in the region of the

stomach, with sour eructations, and frequently vomiting, first of food and then of bilious matter. An attack of this kind tends to subside in a few days, especially if the exciting cause be removed. Sometimes, however, the symptoms recur with such frequency as to lead to the more serious chronic form of the disease.

Treatment.—The treatment bears reference, in the first place, to any known source of irritation, which, if it exist, may be expelled by an emetic, such as syrup of ipecac or warm water. For the relief of sickness, if it be excessive, and pain, the sucking of ice and counter-irritation by mustard plaster or hot fomentations over the region of the stomach as shown by the shaded area in the accompanying figure, are of service. As a rule, no food should be given by the mouth until the stomach becomes retentive. In delicate persons, a nutrient enema will be required. Further, remedies which exercise a soothing effect upon an irritable mucous membrane, such as bismuth or weak alkaline fluids, and along with these the use of a light milk diet, are usually sufficient to remove the symptoms.



If constipated, give the following mercurial laxative:

℞ Calomel .....one grain
Bismuth Subnitrate .....twenty grains
Mix, and divide into eight powders.
Directions: Take one, followed by a swallow of water, every hour. When all are taken, follow with a Seidlitz powder.

After thirty-six or forty-eight hours, one usually can be given nourishment by the mouth, when a light liquid diet should be

adhered to, such as barley-water, milk with lime-water, peptonized milk and light broths, which must be given in small quantities and at frequent intervals. Solid food should not be taken for some time, and then very gradually.

For belching of gas:

℞ Subnitrate of Bismuth .....one ounce
Carbonate of Magnesia .....one ounce
Bicarbonate of Soda .....two ounces
Mix.
Dose: One teaspoonful in a wineglass of water, before meals.

For indigestion and coated tongue:

℞ Dilute Hydrochloric Acid.....one ounce
Dose: Ten drops in a wineglass of water three times a day, after meals.

CHRONIC GASTRITIS—CHRONIC CATARRH

Definition.—This condition may arise after repeated attacks of the acute form or may come on independently. It is of several types. The result of the chronic irritation of the gastric mucous membrane may be an excessively acid gastric juice, which gives rise to an acid dyspepsia. After a long period of irritation an atrophy of the secreting structures of the stomach may be produced, and there is then little or no secretion of gastric juice, a condition known as *gastritis anacida.* In addition to this failure to secrete a proper gastric juice, the interior of the stomach becomes constantly coated with tough mucus, which further prevents digestion from proceeding normally. The mucous membrane is permanently in a state of congestion, it becomes thickened and thrown into deep ridges and furrows, and frequent hemorrhages take place from its dilated veins. At a later stage, great thickening of the other coats may take place (cirrhosis), leading to still further impairment of digestion, since the stomach becomes small, its movements impeded, and the outlet often blocked by especial thickening in the region of the pylorus.

Causes.—Chronic catarrh is frequently associated with previous disease in other organs, such as the lungs, heart, liver, or

kidneys, and it is specially common in persons addicted to alcoholic excess. It may be caused by chronic disease of the stomach itself, such as cancer, ulcer, etc.

Symptoms.—The symptoms are those of dyspepsia in an aggravated form, of which discomfort and pain after food, with distention and frequent vomiting, are the chief.

Treatment must be conducted with reference to the causes giving rise to it. The careful regulation of the diet, alike as to the amount, the quality, and the intervals between meals, demands special attention. Of medicinal agents, bismuth, bitters, nux vomica, and the mineral acids are all used, and, in those forms which are characterized by defective formation of the gastric juice, pancreatic extract administered along with the meals, or the use of peptonized food, is often had recourse to with benefit.

The following formulas are often of value:

℞ Diluted Nitromuriatic Acid .....two fluid drams
Tincture of Cardamom .....four fluid drams
Tincture of Nux Vomica .....two fluid drams
Mixture of Rhubarb and Soda ....one fluid ounce
Mix.
Dose: Twenty drops in water, fifteen minutes before meals.

Or:

℞ Tincture of Nux Vomica .....one ounce
Dose: Ten drops in water three times a day, fifteen minutes before meals.

For relieving the stomach of gas, take twenty to thirty drops of Essence of Peppermint in a half teacupful of hot water;

Or:

℞ Tincture of Ginger .....one-half teaspoonful
Bicarbonate of Soda .....one-half teaspoonful
Directions: Take in a cup of hot water.

Or:

℞ Charcoal .....ten-grain tablets
Dose: One tablet every two hours with hot water until relieved.

WATERBRASH—PYROSIA

Definition.—Waterbrash is a condition in which, during the course of digestion, the mouth fills with tasteless or sour fluid, which is brought up from the stomach. At the same time, a burning pain is often felt at the pit of the stomach or in the chest.

Causes.—The condition is a symptom of excessive acidity of the stomach contents, due sometimes to an irritating diet, and often characteristic of fermentative dyspepsia occurring in a dilated stomach.

Treatment.—The formulas given below will prove useful:

℞ Milk of Magnesia .....two fluid ounces
Mixture of Rhubarb and Soda ....two fluid ounces
Mix.
Dose: One teaspoonful every three hours in half a glass of water.

℞ Bicarbonate of Soda, one teaspoonful with fifteen drops of Essence of Peppermint, may be taken directly after meals, to prevent the eructation.

℞ Sodium Phosphate .....three ounces
Dose: One teaspoonful in half a glass of water, each morning before breakfast.

NEUROSIS OF THE STOMACH

Neurosis of the stomach includes those conditions which do not appear to be associated with any disease in the organ, but are due probably to defective action in some of its nervous connections. Under this heading may be mentioned spasm and other forms of pain referred to the stomach when that organ is apparently not the seat of ulcer, inflammation, or any other gross physical change; also, defective power in the muscular wall and defects of secretion brought about by wasting disease, neurasthenia, and other general conditions, as well as forms of overaction exemplified by sea-sickness and sick-headaches.

Attacks of severe vomiting, called "crises," also form a symptom of the disease known as locomotor ataxia, and fall under this heading.

Treatment.—In such cases the treatment should be directed primarily toward the disease itself.

℞ Bromide of Sodium .....four teaspoonfuls
Essence of Pepsine .....three ounces
Mix.
Dose: One teaspoonful in a little water when stomach is causing pain.

Or:

℞ Dilute Hydrocyanic Acid .....fifteen drops
Tincture of Belladonna .....two teaspoonfuls
Wine of Pepsine .....three ounces
Mix.
Dose: One teaspoonful in a wineglass of water half an hour before meals, three times a day.

DILATATION OF THE STOMACH—GASTRECTASIS

Definition.—Dilatation of the stomach may occur without giving rise to any symptoms, the person in question being simply possessed of a gastric organ of more than usual capacity, but in those cases where portions of the food are retained more or less permanently in the stomach, giving rise to fermentation, to spasmodic and ineffectual efforts of the muscular wall to empty the organ, or to great irritation of the mucous membrane, the condition is both painful and has a serious effect upon the general health.

Causes.—Most of these have been already mentioned. The condition may arise in consequence of weakness of the muscular wall of the stomach as the result of any chronic wasting disease, such as consumption or general enfeeblement of nervous energy brought on by overstrain. Such a defect gives rise to a minor degree of dilatation, the stomach being less active in its movements, and heavy meals being retained in it for many hours or even several days. More common as a cause, however, is narrowing of the outlet from the stomach in consequence of the scar of an old ulcer at the pylorus, or owing to a cancer in this position. Similarly, displacement of a neighboring organ, such as a floating kidney, may block the outlet by pressure on the exterior of the stomach. The condition is also met with in newly born chil-

dren as the result of a very narrow outlet from the stomach. In these conditions food collects in the lower part of the stomach, stretches the wall, and causes the dilatation to become permanent.

Symptoms.—The condition gives rise to much discomfort, which is increased a few hours after meals, when digestion should be in full progress. Heartburn and the feeling of a heavy load under the ribs are often complained of. As the stomach in advanced cases is never completely emptied between meals, only a portion of the food escaping into the small intestine, fermentation goes on in the residue, the vegetable growths of *sarcinæ* and *torulæ* being especially evident in the mass of fermenting material that is vomited up every few days. Various substances, such as lactic acid, butyric acid, and even sometimes explosive gases, are formed as the result of this fermentation, and, owing to the great disturbance of digestion, severe constipation is a very common symptom. Naturally the patient derives little benefit from his food, and becomes weak and thin, the condition for this reason being sometimes mistaken for cancer.

Treatment.—This condition was regarded as incurable till the method of treatment of washing out the stomach daily was suggested, thus removing the fermenting residue, either at night or in the morning. In those cases where the stomach has become so much distended and its wall so weak that it has very little power left for expelling any of its contents through the pylorus, which is situated high up, the condition may sometimes be cured by the operation of gastro-enterostomy. This consists in opening the abdomen, making an aperture at the lowest part of the stomach and one in a coil of the small intestine, uniting the two by sutures, and closing the abdominal wound. The effect of this artificial outlet is satisfactory only in cases of dilatation which have been caused by the scar of an old ulcer. Other cases are usually congenital or inherited, and are combined with a falling or ptosis of the stomach.

An abdominal bandage nearly always affords comfort and gives mechanical support to the stomach.

Medicines such as salol, creosote, and nux vomica may be used, but the washing out of the stomach is far more efficacious.

Faradization and abdominal massage are also useful. Usually

constipation is present, and warm soap-suds enemas or glycerine suppositories should be used.

The following prescription is recommended to be taken night and morning:

℞ Tincture of Belladonna .....two teaspoonfuls
Tincture of Nux Vomica .....two teaspoonfuls
Simple Elixir .....three ounces
Mix.

Dose: One teaspoonful in a wineglass of water, to be taken before bedtime and in morning before breakfast.

ULCER OF THE STOMACH—GASTRIC ULCER

Definition.—Ulcer of the stomach, gastric ulcer, or perforated ulcer is of frequent occurrence, and is a disease of much gravity. It occurs much more frequently than is generally supposed, the result of autopsies showing that one person in every twenty or thereabout suffers from gastric ulcer at some period of life.

Causes.—These are not fully understood, yet the following points may be regarded as generally admitted: (1) that the disease is twice as common in females as in males, and that it is found to affect domestic servants more frequently than any other class; (2) that it occurs for the most part in early life, the period from twenty to thirty including the great majority of the cases; (3) that it may arise in connection with an impoverished state of the blood (anemia), which is actually the condition present in many of the cases, but that it may also arise from diseased blood-vessels, the formation of a clot in a small vessel, the result of long-continued catarrh, or from the irritation and debilitating effects of excessively hot or cold substances.

It is held that when any degenerative change takes place in the mucous membrane of the stomach the part is less able to resist the action of the gastric juices upon it, and is apt to undergo disintegration all the more readily. Hence an ulcer is formed. This ulcer is usually of small size (from a quarter of an inch to one inch in diameter), of round or oval form, and tends to advance, not superficially, but to penetrate through the coats of the stomach. Its most usual site is upon the posterior wall toward the upper or lesser curvature of the stomach and near to

the pyloric orifice. It may undergo a healing process at any stage, in which case it may leave but little trace of its existence; while, on the other hand, its scar may produce such an amount of contraction as to lead to narrowing of the pylorus, and later dilatation of the stomach. But, again, perforation may take place, which in most cases is quickly fatal, unless previously the stomach has become, as it may, adherent to another organ, by which the dangerous effects of this occurrence may be averted. Usually there is but one ulcer, but sometimes there are more.

Symptoms.—The symptoms to which this disease gives rise are often exceedingly indefinite and obscure, and in some cases the diagnosis has been first made out by the sudden occurrence of a fatal perforation. Generally, however, there are certain evidences more or less distinct which tend to indicate the probable presence of a gastric ulcer. First among these is *pain*, which is in some measure present at all times, but is markedly increased after food. This pain is situated either in front, at the lower end of the breast-bone, or, more commonly, behind, about the middle of the back. Sometimes it is felt at one or both sides. It is often extremely severe, and is usually accompanied with much tenderness to touch, and also with a sense of oppression and inability to wear tight clothing. The pain is probably largely due to the active movements of the stomach set up by the presence of the food. Accompanying the pain there is frequently *vomiting*, either very soon after the food is swallowed or at a later period. This tends in some measure to relieve the pain and discomfort, and in many instances the patient rather encourages this act. *Vomiting of blood* (hematemesis) is a frequent symptom, and is most important diagnostically. It may show itself either to a slight extent, and in the form of a brown or coffee-like mixture, or as an enormous discharge of pure blood of dark color and containing clots. The source of the blood is some vessel or vessels which the ulcerative process has ruptured. Vomiting of blood, however, does not always indicate the presence of a gastric ulcer. Blood is also found mixed with the discharges from the bowels, rendering them dark and tarry-looking. The general condition of a patient with gastric ulcer is as a rule that of ill-health, showing pallor, more or less emaciation, and debility. The tongue presents a red, irritable appearance, and there is usually constipation of the bowels.

The course of a case of gastric ulcer is very variable. In some instances it would appear to be acute, making rapid progress to a favorable or unfavorable termination. In most, however, the disease is chronic, lasting for months or years, and in those cases where the ulcers are multiple or of extensive size incomplete healing may take place and relapses of the symptoms occur from time to time. Ulcers are sometimes present and yet give rise to no marked symptoms, and one occasionally meets with cases where fatal perforation has suddenly taken place and where *post-mortem* examination reveals the existence of a long-standing ulcer which has furnished little or no evidence of its presence during life. Again, an unsuspected ulcer may run a favorable course, and the contraction of its scar may, at a later period of life, cause interference with the exit of food by the pylorus and consequent dilatation of the organ, and thus give the only evidence that an ulcer had at one time been present.

While gastric ulcer is always to be regarded as a dangerous disease, its termination, in the great majority of cases, is in recovery. It frequently, however, leaves the stomach in a delicate condition, necessitating the utmost care as regards diet. Occasionally, though rarely, the disease proves fatal by sudden hemorrhage, or by perforation of the stomach and the escape of its contents into the peritoneal cavity, setting up peritonitis or causing severe shock, and followed, as a rule, by death within two days unless operative measures be adopted immediately. Should the stomach become adherent to another organ, a permanent condition of dyspepsia may result, due to interference with the natural movements of the stomach during digestion; while the possibility of stricture of the pyloric opening with dilatation of the stomach as the result of the contraction of a healed ulcer has been already mentioned.

Treatment.—Most important is the careful adjustment of the diet. Milk forms the most suitable aliment, and, while there may be instances in which it fails to agree, even when mixed with lime-water or previously boiled, these are comparatively few. Milk with a large admixture of cream seems to be specially well borne (eight ounces of milk with two ounces of cream and the white of one or more eggs every four hours). The peptonized foods are frequently found of much serv-

ice in this disease. Light soups as well as milk may sometimes be administered in this form with benefit. Later arrowroot, ground rice, and similar starchy foods may be added; and subsequently creams of fish, chicken, etc. The quantity, the intervals between the times of administration, and the temperature, as well as the quality, of the food demand careful attention. In severe cases, where the presence of food in the stomach gives rise to much suffering, nourishment by the bowel is had recourse to, and if the food be given in this way for a period of three or four weeks, the complete rest thus afforded to the stomach is of the utmost value in allowing the ulcer to heal. Of medicinal remedies, the most serviceable are large doses of bismuth and bicarbonate of soda. Rest, consisting of two or three weeks in bed, is essential. When hemorrhage occurs, it is relieved by sucking ice and by such styptics as tannic acid, ergot, and extract of suprarenal gland. No food should be taken into the stomach for a few days, and the patient should be given nutritive or saline enemas. In the event of perforation, the only means of affording relief is by an immediate operation in which the peritoneal cavity is cleansed, and the opening in the stomach wall stitched together. Such an operation must be performed at the earliest possible moment in order to afford good hope of recovery.

℞ Bismuth Subnitrate .....one-half ounce
Dilute Hydrocyanic Acid.....twenty drops
Essence of Pepsine .....three ounces
Mix.
Dose: One teaspoonful three times a day, half an hour after meals.

Or:

℞ Powdered Charcoal .....one-half ounce
Emulsion of Acacia .....one ounce
Peppermint-water .....three ounces
Mix.
Dose: One teaspoonful in a wineglass of water, directly after meals.

Or:

℞ Wine of Pepsine .....three ounces
Dose: Two teaspoonfuls in half a glass of water, to be sipped during meals.

The formula given below will prove beneficial in relieving pain:

℞ Spirits of Peppermint.one and one-half fluid drams
Prepared Chalk .....one-half dram
Calcined Magnesia Carbonate .....one dram
Sodium Bicarbonate .....one dram
Mix.
Directions: Stir one teaspoonful in half a glass of water and sip slowly until pain is relieved.

If the above formula causes constipation, add two teaspoonfuls of milk of magnesia to one teaspoonful of the mixture, and use the same way, by adding it to water and sipping.

CANCER OF THE STOMACH

Definition.—This is one of the most common forms of internal cancerous disease. It occurs for the most part in persons at or after middle life, about the age of fifty-two, and in both sexes almost equally, though at middle life it is much more common in men. Hereditary tendency may sometimes be traced.

Varieties.—The most common varieties of cancer affecting the stomach are scirrhus, medullary, and colloid, and the parts affected are usually at the inlet or outlet; but the disease may spread widely in the stomach wall. When in the neighborhood of the pylorus, a stricture is frequently produced as the disease advances. The cancerous growth usually commences in the submucous tissue, but as it progresses it tends to ulcerate through the mucous membrane, and in this process bleeding and vomiting of blood may occur.

Symptoms.—The symptoms of this disease are in many instances so indefinite as to render the diagnosis for a long time conjectural. They are mostly those of dyspepsia, with more or less pain, discomfort, and vomiting, particularly after meals. The vomited matters are often of coffee-ground appearance, due to admixture with blood, but copious hematemesis is less frequent than in cases of gastric ulcer. The patient loses flesh and strength, and soon comes to acquire the cachectic aspect commonly associated with cancer. The diagnosis is rendered all the more certain when, as is frequently the case, a tumor can be de-

tected on examination over the region of the stomach; but where no such evidence is obtained, the nature of the disease is left to be made out by the age of the patient, by absence of free hydrochloric acid from the gastric juice, and by X-ray examination. Cases of cancer of the stomach advance with more or less rapidity to a fatal termination, which is usually quickest in the medullary form. In most instances death takes place in from six to twenty-four months. Marked temporary improvement frequently occurs under treatment and may prove very misleading.

Treatment.—The treatment can often be only palliative, but much relief may be afforded by a careful attention to diet. In early cases an operation can prolong life for several years, but the disease terminates almost invariably fatally. The formulas given below may be found useful:

℞ Fluidextract of Condurango...one-half fluid ounce
Hydrochloric Acid .....two fluid drams
Compound Tincture of Gentian.one and one-half fluid ounces
Water, enough to make.....three fluid ounces
Mix.
Dose: One teaspoonful in a wineglass of water, after meals.

For relief of distress in stomach:

℞ Calcined Magnesia .....two ounces
Subnitrate of Bismuth .....one ounce
Mix.
Dose: One teaspoonful in half a glass of water, to be taken when pain is severe.

DIGESTION, ABSORPTION, ASSIMILATION

Definition.—These are the three processes by which food is incorporated in the living body. In digestion, the food is softened and converted into a form which is soluble in the watery fluids of the body, or in the case of fat, into very minute globules. In absorption the substances formed are taken up from the bowels and carried throughout the body by the blood. In assimilation, these substances, deposited from the blood, are united with the various tissues for their growth and repair, and

become endowed with the property of life. For the maintenance of health each of these must proceed in a regular manner.

Salivary Digestion begins as soon as the food enters the mouth. Saliva runs from the minute orifices of the salivary gland ducts, and contains a ferment named ptyaline which actively changes the starch of bread, potatoes, and the like, into sugar. The object of chewing is not only to bruise the food, and make it more permeable for the gastric juice, but also to thoroughly mix the starchy parts with saliva. This process goes on, after swallowing, for the first twenty minutes or half hour that the food remains in the stomach, after which the action of the saliva is checked by the acid of the gastric juice.

Gastric Digestion begins a little time after the food enters the stomach, the gastric juice exuding rapidly from the openings of the minute glands with which the interior surface of this organ is covered. This juice contains two ferments, namely pepsine and rennin, the former having the power of softening and dissolving fibrous tissue in the meat, the latter being concerned with the digestion of milk. There are also present free hydrochloric acid, which aids the action of the pepsine and prevents putrefaction of the food, and acid salts such as phosphate of soda, which have a similar action. The slow, churning movements which take place in the walls of the stomach have the effect of thoroughly mixing the food and gastric juice, and, to a slight extent, of breaking up the former. It should be remembered that digestion in the stomach does not prepare the food for absorption, but is intended merely to warm it, thoroughly mix its different constituents, and by a softening process convert it into a gray, semi-fluid mass called chyme. In many healthy persons gastric juice is wanting, so that digestion does not take place at all in the stomach, and indeed in the case of several men and animals the stomach has been completely removed without serious effect. In most persons, however, defective gastric digestion is a painful process, which interferes much with their ordinary employments. Very soon after soft food has been taken, waves of movement may be seen on X-ray examination, the orifice at the lower end of the stomach (pylorus) opens, and the food is squeezed quickly in

small quantities into the bowel; but if any hard food comes in contact with the stomach wall near the exit, the orifice at once closes. Hence it is an error to partake of food till the stomach has completely emptied itself of the previous meal. Gastric digestion of a simple meal of tea, bread, butter, and jam should be complete in about an hour; a meal containing milk, eggs, or light meat requires three or four hours; while a heavy dinner with soup, meat, fruit, and wine or beer is not entirely treated by the stomach till six or seven hours have elapsed.

Intestinal Digestion.—The softened food, or chyme, which leaves the stomach, is exposed in the bowels to the action of four factors: (*a*) bile, (*b*) pancreatic juice, (*c*) intestinal juice, (*d*) bacteria. Bile is collected from the liver and gall-bladder into the common bile-duct, which, together with the duct from the pancreas, opens into the bowel a few inches away from the exit of the stomach. The bile consists mainly of certain complex salts and pigments, which assist in digesting the fats of the food, and partly consists of waste products removed from the blood. The pancreatic juice contains four powerful ferments, which have the following effects: one converts fats into an emulsion, changing them partly into glycerine and fatty acids; a second curdles milk; a third completes the digestion of starch and other vegetable substances; and the fourth converts into soluble substances such foods as flesh, horn, hair, gelatine, and other protein materials. Intestinal juice aids the absorption of sugar, and possibly helps to digest proteins. Bacteria have a most important action, many species of these growing constantly in the intestine, and partly assisting the digestive fluids, partly causing decomposition in the bowel contents. For example, their action upon fats is similar to that of pancreatic juice: from proteins they form the substances (indol and skatol) which give the stools their obnoxious odor; from sugar they produce, under certain circumstances, lactic acid, which may cause diarrhea; and from green vegetables they form carbonic acid and marsh gas, this being the chief source of the gases in the bowels, which are increased in proportion to the vegetable food taken. In certain cases they even destroy alkaloids, poisonous to the body, which have been formed by the digestive juices, notably choline produced from yolk of egg.

Absorption.—The only substance absorbed from the stomach to any extent is alcohol. Water is quickly passed from the stomach into the intestine, and considerable quantities are there absorbed in a few minutes. But it is only after subjection to digestion in the intestine for several hours that the bulk of the food is taken up into the system. The semi-solid chyme which leaves the stomach is converted into a yellowish fluid of creamy consistence called chyle by the action of bile and pancreatic fluid. From this the fats, in the form of a fine emulsion, are taken up by lymph vessels called lacteals, and ultimately reach the blood, while sugars, salts, and soluble proteids pass directly into the small blood-vessels of the intestine. The process is facilitated by the extreme unevenness of the intestinal wall, which is folded into many ridges and pockets, while in microscopic structure the surface is covered by fine finger-like processes named "villi," which are bathed in the fluids passing down the intestine. Further, absorption is probably assisted by the leucocytes, or white cells of the blood, which are enormously increased in numbers after a meal, and which have the power of wandering out of the blood-stream and taking up particles into their substance. The food is passed down the intestine by the contractions of its muscular coat, and, finally, the indigestible residue, together with various waste substances excreted from the liver and intestinal walls, is cast out of the body in the stools.

Assimilation takes place more slowly, the blood circulating through every organ, and each taking from it what is necessary for its own growth and repair. Thus the cells in the bones extract lime salts, muscles extract sugar and protein, and so forth. When the supply of food is much in excess of the immediate bodily requirements it is stored up for future use, fat being deposited in various sites, sugar being converted into glycogen in the liver, and so forth. The greater bulk of nutriment is assimilated by the muscles for heat production and work, the sugar and protein being built up into a substance which forms the permanent part of the muscle, and is named "inogen." The substance so formed undergoes chemical changes, and is broken down to form carbonic acid and lactic acid as the muscle does work. All these changes are carried on in solution in water,

and about half a gallon of this fluid must be drunk or taken with the food and absorbed daily, a similar amount being discharged from the body in the urine, perspiration, and other excretions.

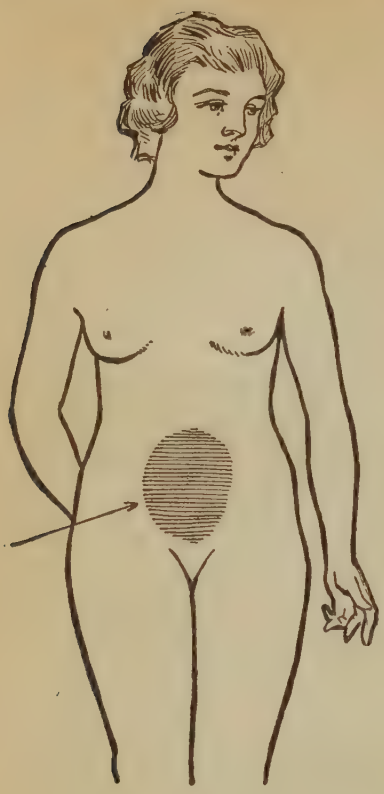
COLIC

Definition.—By this term is generally understood an attack of pain in the abdomen, usually seated in the neighborhood of the navel, of spasmodic character, and attended for the most part with constipation of the bowels.

Causes.—Simple colic commonly arises from the presence in the alimentary canal of some indigestible matter, which not only excites spasmodic contraction of the muscular coats of the intestines, but also, by beginning to undergo decomposition, gives rise to the presence of gases, which painfully distend the bowels and increase the patient's suffering. The pain of colic is relieved by pressure over the abdomen, and there is no attendant fever—points which are of importance in distinguishing it from inflammation.

Attacks of colic may occur in connection with a variety of causes other than that above mentioned, for instance from accumulations of feculent matter in the intestines in the case of those who suffer from habitual constipation; also as an accompaniment of nervous and hysterical ailments and not infrequently as the result of exposure to cold and damp, particularly where the feet become chilled, as in walking through snow. Similar attacks of colic are apt to occur in young infants, especially those who are fed artificially; and in such cases it will generally be found that the food is passing through them almost wholly undigested, and that a temporary change of diet will be necessary. The duration of an attack of simple colic is seldom long, and in general no ill consequences follow from it. It is, however, not free from risk, especially that of sudden obstruction of the bowel from twisting, or invagination of one part within another (intussusception), during the spasmodic seizure, giving rise to a very grave condition.

Treatment.—The treatment of colic consists in means to relieve the spasmodic pain, and in the removal, where possible, of the cause upon which it depends. The former of these



indications is fulfilled by the application of warm fomentations to the abdomen over the shaded area as indicated in the accompanying figure. Where the attack appears to depend on accumulations of irritating matter in the alimentary canal, a brisk purgative will, in addition, be called for. Pressure upon the abdomen is also very effective in relieving the pain partially if not completely. It may be effected, in the case of a child, by laying it face downward across the nurse's arm, and in the case of older people by laying a hot-water bottle or mustard plaster upon the abdomen. The various substances known as carminatives or antispasmodics also aid in giving relief.

The following formulas will be found useful:

℞ Aromatic Spirits of Ammonia ..... two drams
Tincture of Rhubarb ..... one dram
Tincture of Cayenne Pepper ..... one dram
Spirits of Camphor ..... one dram
Dilute Alcohol ..... three drams

Dose: One teaspoonful in a quarter of a glass of water every three hours.

Or:

℞ Compound Spirits of Ether ..... two drams
Tincture of Ginger ..... two drams
Aromatic Spirits of Ammonia ..... four drams

Dose: One teaspoonful in a wineglass of water every three hours.

Or:

℞ Tincture of Belladonna ..... two teaspoonfuls
Peppermint-water ..... three ounces

Dose: One teaspoonful in a wineglass of water every hour until relief is obtained.

For infants and small children, give hot water, gradually sipped from a teaspoon; also peppermint-water is most useful. Hot applications to the stomach are good.

FLATULENCE

Definition.—Flatulence means a collection of gas in the stomach or bowels. In the former case the gas is expelled from time to time in noisy eructations by the mouth; in the latter case it may produce unpleasant rumblings in the bowels.

Causes.—When gas is found in large amount in the bowels its production is usually due to fermentation set up by bacteria. Marsh gas and hydrogen are formed from the cellulose of vegetables, sulphureted hydrogen and carbon disulphide from eggs, peas and other articles of diet containing much sulphur. In some cases also carbonic acid gas is said to pass out from the blood, causing the flatulence of nervous people.

The following have been found useful in flatulence and gastric fermentation:

℞ Chloroform-water .....four fluid ounces

Dose: One tablespoonful before and after meals.

Or:

℞ Rhubarb and Soda Mixture .....two fluid ounces
Milk of Magnesia .....two fluid ounces
Tincture of Nux Vomica .....one fluid dram

Mix.

Dose: Two teaspoonfuls in water, after meals.

DYSENTERY

Definition.—Dysentery, also called bloody flux, is an infectious disease with a local lesion in the form of inflammation and ulceration of the lower portion of the bowels.

Causes.—Dysentery in a scattered form may occur anywhere, but this variety of the disease is believed to depend on a different cause from that to which it is due where it prevails endemically or spreads as an epidemic; for, while isolated cases appear capable of being excited by irritating causes which act locally on the alimentary canal, and may thus be developed out of an ordinary intestinal catarrh, the dysentery of tropical climates is generally regarded as owing its origin to a specific germ or

group of germs, much as Asiatic cholera is now known to be due to the comma bacillus. In many cases of dysentery an animal, not a vegetable parasite like the majority of micro-organisms, appears to be the cause, and other cases have been traced to a bacillus, while still others, and these perhaps the great majority of cases, seem to be due to a growth of many varied organisms.

Varieties.—Several varieties of dysentery are described in which the symptoms are modified by the association of the disease with other morbid conditions. Thus the form known as *malarial dysentery* is complicated with febrile attacks of an intermittent character, and is frequently attended with hepatic, splenic, and renal affections, while it is most successfully treated by remedies which are of value in malarial diseases, such as quinine. Again, in *scorbutic dysentery* the attack is accompanied with the great prostration characteristic of scurvy, and also with dangerous hemorrhage. *Malignant dysentery* is the term applied to those cases where all the symptoms are present in great intensity, and progress rapidly to a fatal termination. Such cases are often attended with gangrene and sloughing of the mucous membrane in the affected portion of the bowels.

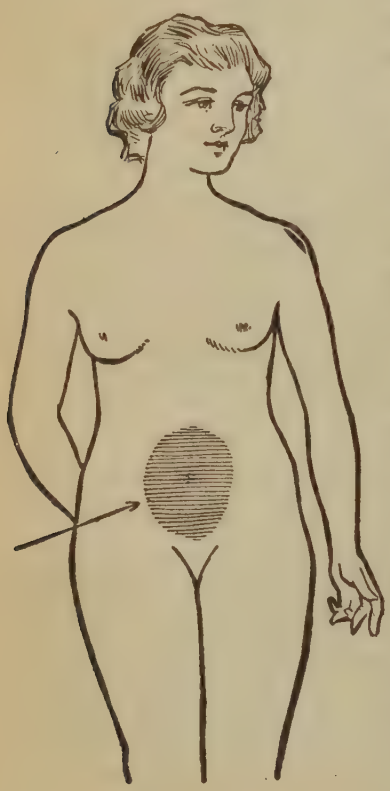
The dysentery poison appears to exert its effects upon the glandular structures of the large intestine, particularly in its lower part. In the milder forms of the disease there is simply a congested or inflamed condition of the mucous membrane, with perhaps some inflammatory exudation on its surface, which is passed off by the discharges from the bowels; but in the more severe forms ulceration of the mucous membrane takes place. Commencing in and around the solitary glands of the large intestine in the form of exudations, these ulcers, small at first, enlarge and run into each other, till a large portion of the bowel may be implicated in the ulcerative process. Should the disease be arrested, these ulcers may heal entirely, but occasionally they remain, causing more or less disorganization of the coats of the intestines, as is often found in chronic dysentery. Sometimes, though rarely, the ulcers perforate the intestines, causing rapidly fatal inflammation of the peritoneum, or they may erode a blood-vessel and produce violent hemorrhage. Everywhere they undergo healing, they may cause so much narrowing of the intestinal canal as to give rise to symptoms of obstruction

of the bowels later on. The occurrence of abscess of the liver in connection with dysentery has been frequently observed. It comes on sometimes a considerable time after the attack of dysentery even when the affected person has left the tropics and returned to a temperate clime.

Symptoms.—Dysentery manifests itself with varying degrees of intensity, but in well marked cases the following are the chief symptoms. The attack is commonly preceded by certain premonitory indications in the form of general illness, loss of appetite, and some amount of diarrhea, which gradually increases in severity, and is accompanied with griping pains in the abdomen. The discharges from the bowels succeed each other with great frequency, and the painful feeling of downward pressure (tenesmus) becomes so intense that the patient is constantly desiring to go to stool. The matters passed from the bowels, which at first resemble those of ordinary diarrhea, soon change their character, becoming scanty, mucous or slimy, and subsequently mixed with, or consisting wholly of, blood, along with shreds of exudation thrown off from the mucous membrane of the intestine. The evacuations possess a peculiarly offensive odor characteristic of the disease. Although the constitutional disturbance is at first comparatively slight, it increases with the advance of the disease, and febrile symptoms come on attended with urgent thirst and scanty and painful flow of urine. Along with this the nervous depression is very marked, and the state of prostration to which the patient is reduced can scarcely be exceeded. Should no improvement occur, death may take place in from one to three weeks, either from repeated losses of blood, or from gradual exhaustion consequent on the continuance of the symptoms, in which case the discharges from the bowels become more offensive and are passed involuntarily.

When, on the other hand, the disease is checked, the signs of improvement are shown in the cessation of pain, in the evacuations being less frequent and more natural, and in relief from the state of extreme depression. Convalescence is, however, generally slow, and recovery may be imperfect—the disease continuing in a chronic form, which may exist for a variable length of time, giving rise to much suffering, and not infrequently leading to an ultimately fatal result.

Treatment.—Where the disease is endemic or is prevailing epidemically, it is of great importance to use all preventive measures, and for this purpose the avoidance of all causes likely to precipitate an attack is to be enjoined. Exposure to cold after heat, the use of unripe fruit, and intemperance in eating and drinking should be avoided, and the utmost care taken as to the quality of the food and drinking-water. In houses or hospitals where cases of the disease are under treatment, disinfectants should be freely employed, and the evacuations of the patients removed as speedily as possible. In the milder varieties of this complaint, such as those occurring sporadically, and where the symptoms are probably due to matters in the bowels setting up the dysenteric irritation, the employment of diaphoretic medicines is to be recommended, and the administration of such a laxative as castor-oil will often, by removing the source of the mischief, arrest the attack.



In the severer forms of the disease, those, namely, occurring in warm climates, the remedy most to be relied on is ipecacuanha. It is administered in full doses of from twenty-five to thirty grains of the powder, which are repeated in from six to ten hours, gradually lessening the quantity; the effect observable is a diminution in the pain and in the frequency and offensive character of the stools, along with the accession of profuse perspiration and quiet sleep. Another form of treatment which has been used with success consists in the administration of small doses of Epsom salts very frequently repeated, and continued for a day or more. Hot fomentations applied to the abdomen over the shaded area as indicated in the accompanying figure are of use in relieving the tenesmus. Ice may be freely taken to allay thirst. The diet should be light, consisting of soups and farinaceous

food. In malarial dysentery quinine is the most successful remedy, ipecacuanha being generally found to be unsuitable; while in scorbutic dysentery the treatment must bear reference to the depraved condition of the general health characteristic of scurvy.

In chronic dysentery, the administration of astringents may be of service; but the chief points to which attention should be given are the proper nourishing of the patient, and the observance of judicious hygienic measures, such as the due clothing of the body, the use of tonics, baths, etc. A method of treatment which has often resulted in cure consists in the administration every day or two of purgative doses of castor-oil combined with opium in order to relieve pain. Another procedure which is almost always attended with benefit is the daily washing out of the lower bowel with warm salt water or some mild astringent in large quantities, or an infusion of ipecac root in hot water.

℞ Bismuth Subnitrate ..... two teaspoonfuls
Salol ..... one teaspoonful
Mix, and divide into twelve powders.
Dose: One powder to be given every two hours with a swallow of water.

Among the many medicines that are used, the following have proved the most reliable:

℞ Oil of Turpentine ..... two fluid drams
Paregoric .....two fluid drams
Syrup of Acacia .....one and one-half ounces
Mucilage of Acacia .....seven ounces
Mix.
Dose: One tablespoonful every two or three hours; reduce the dose after twenty-four hours if there is an improvement.

Or:

℞ Sulphur, powdered .....four teaspoonfuls
Tannic Acid .....two teaspoonfuls
Mix, and divide into ten powders.
Dose: One powder every four hours; children in proportion.

INFLAMMATION OF THE BOWELS—COLITIS —ENTERITIS

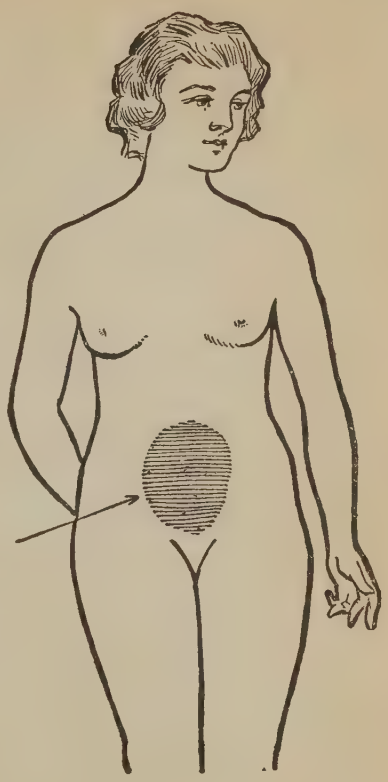
Definition.—Inflammation may affect either the outer or the inner surface of the bowels. The outer surface is covered by peritoneum, and peritonitis is a serious disease with very special symptoms. Inflammation of the inner surface is known generally as enteritis, inflammation of special parts receiving the names of colitis, appendicitis, etc. Enteritis may form the chief symptom of certain infective diseases due to special organisms, for example in typhoid fever, cholera, dysentery. Again, it may be acute, though not connected with any definite organism, when, if severe, it is a very serious condition, particularly in young children, to whom the enteritis producing summer diarrhea is a very fatal malady. Or it may be chronic, especially as the result of dysentery, and produces then a less serious though very troublesome complaint.

Causes.—Indiscretions in diet, such as the eating of unripe fruit, form the general cause, and a very serious type results from the action of irritant poisons. In some persons inflammation of the stomach and bowels is produced by exposure to cold and damp, though in most people a more usual result is inflammation of the air-passages, causing a cold in the head or bronchitis. This disease may frequently be traced to infectious materials or germs, taken in with raw or spoiled food, or in pus coming from infections of the nose, throat, or teeth.

Symptoms.—Diarrhea is the most common and most marked symptom, and in chronic cases usually the only symptom, though, when the small intestine alone is affected, constipation is a more usual result than diarrhea. Pain, particularly of a griping nature, which comes and goes, is also common. The temperature in acute cases is raised, and there is restlessness, even delirium. If the diarrhea is very profuse, collapse speedily comes on.

Treatment.—Each case requires special handling, according to the cause and the severity. Where diarrhea is very severe, this requires special treatment. There are a few general principles which are applicable to all cases. Food should be withheld completely for a day, so that the inflamed surface may not be irritated by the passage over it of half-digested food. Rest

in bed is essential. Considerable quantities of warm water have a beneficial action by flushing out the bowels and removing irritating substances. In general, water is given by the mouth, and in some cases it is introduced by an enema to irrigate the lower bowel. Various drugs which have a mildly astringent and soothing action, of which the chief is bismuth, are given by the mouth. In many cases the antiseptic treatment is adopted, small quantities of strong antiputrefactive substances being given at frequent intervals to check decomposition in the bowels; of these the chief are calomel, salol, naphthol, and various essential oils and aromatic bodies. In acute cases of inflammation, various applications are made to the surface of the abdomen over the area as indicated by the accompanying figure, in order to exert a soothing effect. The most common are hot fomentations, to which turpentine has been added.



℞ Salol .....five-grain tablets
Dose: One tablet to be taken with a swallow of water three times a day.

Or:

℞ Powdered Charcoal .....one-half ounce
Subnitrate of Bismuth .....one-half ounce
Essence of Pepsine .....three ounces
Mix.
Dose: One teaspoonful in a wineglass of water, directly after each meal.

Or:

℞ Calomel .....half-grain tablets
Dose: One tablet every three hours; but they should not be taken directly before or after meals.

The bowels should be kept open by enemas of hot saline water, and when there is great pain in the abdominal region castor-oil should be given, followed by the sedative formula given below:

℞ Bismuth Subnitrate .....two drams
Salol .....twenty-four grains
Compound Chalk Mixture .....three fluid ounces
Mix.
Dose: One teaspoonful every two hours.

ULCERATION OF THE BOWELS

Causes.—Ulceration of the bowels arises in a manner similar to the production of ulcers on the skin surface, though probably these internal ulcers heal much more rapidly than others. They may be due to scratches produced by sharp, hard bodies which have been swallowed, or to other injuries which damage the surface and lead to its destruction by the digestive juices. Such ulcers are found not infrequently in the duodenum just outside the stomach, and give rise to symptoms much resembling those of gastric ulcer. Typhoid fever regularly produces ulcers in the lower part of the small intestine, this variety arising in the patches of lymphatic tissue found in this region. Tubercular ulcers arise late in the course of consumption, and produce a diarrhea which not uncommonly terminates this malady in death.

Symptoms of ulceration are much the same as those of enteritis, and the formation of ulcers is simply an advanced stage of this condition. In addition, the ulcerated surface is apt to bleed, and if the ulcer be situated high up in the bowel, this blood is voided as black or brown material; if it comes from near the lower end of the bowel, the blood is red and unchanged. The healing of these ulcers leads, in the case of all save those of typhoid fever, to the formation of scars, and as these scars contract there is a tendency to narrowing of the bowel and obstruction. This is particularly apt to follow tubercular ulcers, if these should heal, because they often run circularly round the inside of the bowel.

Treatment in cases of ulceration is similar to that for inflammation. The best purgative to use when this condition is present is the following:

℞ Russian Mineral Oil ..... one-half pint
Dose: One tablespoonful night and morning.

High antiseptic rectal injections may be given, alternating with injections of silver nitrate in a well diluted solution.

DIARRHEA

Definition.—Diarrhea, or looseness of the bowels, is, except in its mildest forms, a most serious condition. It is really a symptom of some disease situated in the bowels, but deserves special mention because of its serious import.

Varieties and Causes.—Diarrhea forms the chief symptom of several serious diseases, but it would be a great mistake to imagine that by checking the diarrhea the disease is of necessity successfully treated. For example, the severity of an attack of cholera or dysentery is gauged mainly by the extent to which diarrhea is present; in typhoid fever, persons fed upon ordinary diet have much diarrhea, so that this is a usual feature in early stages of this disease; in tubercular ulceration of the intestine (consumption of the bowels) a diarrhea is set up which speedily brings down the sufferer; and in hysteria, diarrhea is occasionally a troublesome manifestation. In some diseases of the liver, kidneys, lungs, or heart, diarrhea ensues as a result of congestion of the bowels, or through the bowels taking up in part the eliminating functions of the damaged organs. In such cases the diarrhea may actually be a salutary thing. These special forms are treated under the headings of the respective diseases which produce them.

Catarrhal diarrhea is the ordinary form, and in it the intestinal mucous membrane is in much the same condition of congestion and swelling as the nasal mucous membrane during a cold in the head, and secretes, in great amount, clear, viscid mucus of a similar nature. This catarrhal diarrhea may be produced in a slight degree by indigestible food, by nervous excitement, or as the result of a chill. In a severer form, it is not infrequently

due to the irritation set up by poisons, either of an organic nature, such as the toxines and ptomaines which occasionally develop in canned and decaying meats, or of an inorganic nature, such as salts of mercury and arsenic. Atmospheric conditions also play an important part, some persons taking an attack of diarrhea upon a change of weather, just as others develop a catarrhal condition in the air-passages. In children, again, summer diarrhea, commencing as an epidemic in the month of June, reaching its greatest extent in July, and falling off again during August and September, forms one of the greatest and yearly recurring menaces to life in early years. A child runs the greatest risk from this in its second year, particularly if it be fed on artificial foods, and if the weather be very sultry. The practice of adding irritating antiseptics to the milk in order to preserve it in summer is probably also a factor in the production of this type of diarrhea. Bacteria, however, play perhaps the chief part in prolonging the irritation, for the stools, which are frothy and brown or green in color, with a peculiarly disagreeable odor, are found on microscopic examination to swarm with micro-organisms of many sorts.

Choleraic diarrhea, or "cholera nostras," is an extremely severe type of diarrhea due to similar causes, and resulting very often in death. Its symptoms are hardly distinguishable from those of true cholera.

Lienteric diarrhea is a chronic form, in which the taking of food brings on shortly a movement of the bowels. The condition may become so aggravated that food passes rapidly and undigested through the body, and the sufferer becomes very thin.

Pancreatic diarrhea is a form occasionally met with in children of imperfect development, in consequence of failure by the pancreas to secrete its proper digestive fluid.

Mucous colitis is a chronic condition in which attacks of diarrhea recur from time to time, accompanied by the discharge of large quantities of clear mucus, or of strings, and long, ragged pieces of hardened mucus resembling skin.

Diarrhea may also be a symptom of ulceration or gangrene of the bowels, and is then associated with the passage of *blood and mucus,* or even of shreds of membrane produced by the destruction of the inner surface of the bowels.

Treatment.—The treatment of diarrhea which is an incident of special diseases like cholera, typhoid fever, dysentery, etc., is considered under these heads.

Acute diarrhea, it must be remembered, is often merely a symptom, either of one of the above diseases, or of some local disease like intussusception, so that if the symptom be treated as if it were the real disease, the consequence may be disastrous to the sick person. Assuming that we are dealing simply with cases of uncomplicated *catarrhal diarrhea*, we may consider the treatment of an adult and child separately.

In adults, if the attack has followed the eating of some indigestible substance, a dose of castor-oil (two tablespoonfuls) or of calomel (four grains) may be given. If, after this has acted, the diarrhea lasts more than a couple of days, give aromatic chalk powder or carbonate of bismuth in thirty-grain doses three or four times daily.

Diet.—The diet must be bland and unirritating, milk alone, or milk with a little arrowroot or corn-starch, in nearly all cases being most suitable. To the milk may be added two or three tablespoonfuls of lime-water for every tumblerful; or isinglass, one teaspoonful to a pint of warmed milk; or the milk may be peptonized with advantage. In some cases, however, milk is found very irritating, especially when the stools are acid, with a sour but not very offensive smell. In these cases barley-water, the white of an egg stirred up in water, or raw meat juice in water, is most suitable. In any case, food should be given every two or three hours, and only about six ounces at a time.

In children, under similar conditions, a dose of castor-oil varying, according to age, from a teaspoonful to a dessertspoonful, may be tried. Various antiseptics like salol, salicylate of bismuth, gray powder, calomel, chlorine water, etc., are given, particularly when the stools are alkaline and offensive, but they are often both ineffectual and irritating. Perhaps the least objectionable is gray powder, given in half-grain doses to a young child several times in a day. Irrigation of the bowel, through a soft india-rubber tube, is often practised, with most beneficial results. If the child become very collapsed, or if it be receiving no food, whisky may be given every few hours to the extent of twenty drops in a teaspoonful of water. In violent diarrhea

cold-water cloths or mustard plaster to the abdomen give great relief from pain.

Diet.—As to diet, the nature of this should be similar to that for adults. When the stools are alkaline, fermenting, and offensive, milk and starchy foods form the best diet; and when the stools are acid, sour in smell, and green in color, albuminous fluids like barley-water and meat juice suit best, but this is not an absolute rule. If milk be given it should be boiled, and in the case of young children should be diluted with water; one tablespoonful of lime-water being added, in any case, to each half-pint of the fluid. Peptonizing is often helpful. A great tendency exists to give too much food, which sometimes prolongs an attack; and it is often a good plan to administer only water and sips of barley-water for a day.

Chronic diarrhea requires, above all things, complete rest in bed and a simple diet, such as peptonized milk, or white of egg in water, or tea and toast. Washing out of the lower bowel through a soft rubber tube, and the injection of various soothing and astringent fluids, is of great benefit. Among the few useful drugs are carbonate of bismuth in large doses of a teaspoonful, and salicylate of bismuth in smaller doses. In many cases, particularly in nervous forms, tonics may do much good. If the diarrhea is tubercular, appropriate general treatment must be adopted.

The best astringent to be used in irrigating the bowel is the following:

℞ Nitrate of Silver .....five grains
Boiled water .....three pints
Mix.

Directions: Inject this into the rectum as hot as can be borne and retain it for fifteen minutes.

For sudden diarrhea:

℞ Tannalbin .....two teaspoonfuls
Bismuth Subcarbonate .....four teaspoonfuls
Chalk Mixture .....four ounces

Dose: One teaspoonful every two hours.

Or:

℞ Bismuth Subgallate.....five-grain tablets

Dose: Two tablets with water every two hours until evacuations cease.

CONSTIPATION—COSTIVENESS

Definition.—Constipation means a condition in which the bowels are opened too seldom or incompletely. It should, however, be borne in mind that, though most persons have in health one daily movement of the bowels, some perform this act twice, while in others a motion once in two or more days is considered perfectly natural. Constipation is a chronic condition, and must be carefully distinguished from acute obstruction of the bowels, a much more serious condition. The stool of a healthy person, with good appetite, should be light brown in color, about five ounces in weight, and about five inches long, should cohere in one or two pieces but should be sufficiently light to float in water. Great variations, however, take place in color, in amount, and in consistence, according to the nature and quantity of the food and drink taken.

Causes.—The discharge of the undigested remnants of food is, of course, directly dependent on the proper performance of the complex act of digestion, and often some change in diet may be sufficient to relieve the constipated condition. Any derangement of the liver which produces a deficiency of bile may lead to constipation of this type, which is, moreover, cured as the condition of the liver improves. There are, however, many cases in which digestion is good, but some cause interferes with proper evacuation of the undigested remnants.

General causes.—There is a particular type of person all of whose functions, mental and bodily, are slowly performed, though the physique may be good and the intellect powerful, and such persons are specially liable to have constipation. Many persons of an active temperament, if deprived of their usual exercise for a day or two, or especially if they take up a sedentary employment, begin at once to suffer in a marked degree from this trouble. In some persons even a railway journey, or long carriage drive, is sufficient to disorganize the movements of the bowels for days. General sluggishness in the earlier part of the day, including constipation, is not infrequently produced by too great an allowance of sleep. The drinking-water, when very hard or very soft, is in some cases responsible, through an astringent effect produced by too great a proportion of lime salts,

or by lead dissolved from the cistern and water-pipes. The quality of the drinking-water is usually the cause of constipation from which some people find themselves liable to suffer whenever they go for a few days to some special locality. Further, some diseases of a constitutional nature, of which diabetes is the chief, produce marked constipation. Chlorosis is another condition which, in young girls, is associated with constipation, and which generally yields readily to treatment.

Local causes.—The passage of the materials, taken in as food, occupies about three or four hours through the small intestine, and sixteen hours or thereabout through the shorter and wider large intestine. In constipation, the delay takes place usually in the latter, the functions of which are slow in any case. There may be an actual blockage to the passage, by tumors in the neighborhood of, or inside of, the bowels, by the gravid womb during pregnancy, by displacement of various abdominal organs, by narrowing of the passage owing to the scars of previous diseases, or simply by a large mass of hardened stools due to long-continued constipation. But apart from these rarer conditions, most cases are due either to the fact that the lower part of the bowel has lost its tone and is flaccid and weak, or to the fact that its movements are irregular, instead of being directed toward squeezing on the motions, slowly and systematically, to the outlet. The latter condition is found in those who, instead of making a regular practice of relieving the bowels daily at the same hour, on account of business, or social duties, or irregular hours of rising, neglect this important natural function. It occurs also in persons suffering from painful conditions of the bowel itself, such as piles, or of neighboring organs, such as the ovaries, womb, or bladder. Intractable constipation in children is not uncommonly attributable to the necessity for circumcision, and is relieved by this operation. In old people, constipation of this spasmodic sort is often a great annoyance. The stools are passed in small, hard pieces, and, not uncommonly, covered by skin-like fragments of mucus, produced by the state of chronic irritation which the retained stools set up in the mucous membrane lining the bowels. The other condition of flaccidity follows upon long-continued constipation, on account of the lower bowel being constantly distended with putrefying materials, instead of being allowed to contract after a movement for some hours every day,

also in elderly women who have borne several children, and in neurasthenic persons, whose whole muscular system has become flaccid. It happens also, at times, when too little food is taken, or when the great bulk of the food consists of substances, such as milk, which form perfect foods, and leave no residue to stimulate the wall of the intestine to contraction. A similar condition follows, as a reaction, upon the copious evacuation of the bowels due to a powerful purgative, and in persons who constantly use aperients unnecessarily, or in a wrong way.

Symptoms and Effects.—The stools are, as is well known, dark, hard, and passed with difficulty, and in small amount. There is often swelling of the abdomen, from the retention of large masses of the remnants from digestion. Colic is common, and there is a special liability to the occurrence of such troubles as peritonitis and appendicitis. Piles, which are a cause of increasing constipation, are often brought on by inattention to the bowels, to begin with. When the condition has become habitual, the whole digestion is thrown out of gear, and there are foul tongue, bad breath, and loss of appetite. The other bodily functions become impaired also, so that bloodlessness, headache, lassitude, debility, loss of memory, and tendency to apoplexy are common occurrences.

Treatment.—The first step, in treating constipation, is to obviate, so far as possible, any of the general causes, described above, which tend to bring on the condition. Assuming that there is no cause, such as diabetes, or chlorosis, or impure drinking-water, or any tumor or other source of mechanical obstruction, the most important matter is, perhaps, the regulation of the daily habits. The person concerned should not sleep an unreasonable length of time. He or she should take a certain amount of exercise daily, without fail, the extent depending on the physique, but amounting, at least, to walking several miles or its equivalent. Above all things, a habit of opening the bowels at the same time every day should be cultivated; a definite hour should be fixed, preferably after a meal, and best after breakfast, and, no matter whether there be a sensation that the bowels will move or not, the attempt should unfailingly be made. Persons who are at all robust have the vital functions quickened by a cold bath on rising, and, among other things, this assists the shaking off of constipation. Some persons find that smoking a pipe of tobacco after breakfast is also beneficial.

The use of aperients and purgatives is a much debated question. When the bowels are sluggish, and when the milder means have been tried without avail, they should certainly be adopted, but should be used in such a way as to form an article of diet. For example, a few drops of liquid extract of cascara with half a teaspoonful of glycerine in water three times daily after meals, or an after-dinner pill of aloes, may be taken. Liquid paraffine in doses of a dessert or tablespoonful is an excellent and harmless remedy for regular and prolonged use.

Persons of a generally flaccid or neurasthenic type are often benefited by massage of the abdomen, consisting of firm rubbing round this cavity in the direction of the hands of a clock, so as to stimulate the gentle movements of the bowels, and by various forms of electrical application. When the flaccidity affects the lower end of the bowel merely, and it is felt that the stools are ready to be expelled, while the difficulty lies in the act of expulsion, an injection of a few ounces of cold water may be made every morning, or, when this is useless, and the stools are very hard, a pint or more of warm soapy water, or half a pint of warm olive oil, now and then. These warm injections must not become a regular habit, or in the end they will simply increase the flaccidity from which the constipation arises. Instead of the enema, a teaspoonful of glycerine may be injected with a small syringe, or a suppository of glycerine or pellet of common soap, as large as a hazel nut, may be introduced into the bowel after breakfast. Further, persons suffering from this flaccid state should adopt a crouching instead of a sitting posture in opening the bowels.

The following are useful formulas:

℞ Fluidextract of Frangula ..... two fluid ounces
Fluidextract of Cascara ..... two fluid ounces
Glycerine .....six fluid drams
Mix.
Dose: One or two teaspoonfuls in a wineglass of water at bedtime.

Or:

℞ Epsom Salts .....two tablespoonfuls
Rochelle Salts .....two tablespoonfuls
Cream of Tartar .....two tablespoonfuls
Black Draft .....three ounces
Dose: One teaspoonful three times a day.

Or:

℞ Aloine .....six grains
Strychnine Sulphate .....one-half grain
Extract of Belladonna .....three grains
Powdered Ipecac .....eight grains

Mix, and make into twenty-four pills.

Dose: One pill daily.

Or:

℞ Liquid Albolene .....eight fluid ounces

Dose: One tablespoonful after meals for two days; then decrease dose gradually to one teaspoonful after meals.

Or:

℞ Compound Elixir of Cascara Sagrada.....four fluid ounces

Dose: One teaspoonful in a wineglass of water at bedtime.

Diet.—The diet is of vital importance. On the whole, in cases of constipation, this errs in being too concentrated and too unirritating, although the same trouble exists among country-people who use a coarse vegetable dietary. As a rule, however, the diet should be changed to include oatmeal, brown bread, green vegetables, and fruit, especially fruits like prunes, which have a large indigestible residue, while a considerable amount of fluid should be taken. The juice of an orange or lemon in the early morning, or a draft of one of the mildly aperient waters such as Hunyadi Janos, or Apenta, in strength of about a wineglassful to a tumblerful of plain cold or warm water, taken immediately on getting out of bed, is also helpful. When a coarse diet has been tried without avail, particularly in persons who have been addicted to the use of violent purgatives, a change to a diet of milk, white soups, and fish in small amount, with an avoidance of meat, eggs, and all coarse vegetables, is likely to be beneficial. Whichever type of diet be taken, soft fats, such as cream, butter, and salad oil, in large quantities, are of immense value; and mild laxatives, such as a teaspoonful of milk-sugar in water, lemon-squash, or lime juice in water, taken as a drink after each meal, are quite devoid of hurtfulness in all types of cases.

OBSTRUCTION OF THE BOWELS

Definition.—Obstruction of the bowels means a stoppage to the passage down the intestine of the partially digested food. It may be due either to some cause without the abdomen or to the thrusting of a loop of bowel through an opening in the wall of this cavity. Obstruction may be acute, when it comes on suddenly with intense symptoms, or it may be chronic, when the obstructing cause gradually increases and the bowel becomes slowly more narrow till it closes altogether, or when slight obstruction comes and goes till it ends in an acute attack. In chronic cases the symptoms are much the same as those of the acute variety, though they are milder in degree.

Causes.—Obstruction may be due to causes outside the bowel altogether, for example, the pressure of tumors in neighboring organs, the twisting round the bowel of bands produced by former peritonitis, or even the twisting of a coil of intestine round itself so as to cause a kink in its wall. Or the cause of the obstruction may exist in the wall of the bowel itself, for example, a tumor, or the contracting scar of an old ulcer, or the curious condition of "intussusception," where part of the bowel passes inside of the part beneath it, in the same way as one turns the finger of a glove outside in. Or thirdly, some body such as a concretion or the stone of some large fruit, or even a mass of hardened feces may become jammed within the bowel and stop up its passage.

Symptoms.—There are four chief symptoms of this condition, and any case where these are combined demands immediate treatment. There are pain, vomiting, constipation and swelling of the abdomen. The pain is of a griping character, and may be very severe, though it comes and goes, getting now stronger and again for a time less marked. When the small intestine is the seat of obstruction the pain is almost always referred to the region round the navel; when the large intestine is affected, the pain may be more accurately referred to the part from which it arises. In addition to this, acute cases are marked by great tenderness of the abdomen to touch. The vomiting is peculiar in character. It begins with the first onset of pain, and consists of the contents of the stomach. Later it is yellow, bitter, and

contains much bile, while, after several hours have elapsed, it becomes brown and ill smelling, consisting of the contents from far down the intestine, and is then known as fecal vomiting. The constipation in acute cases comes on suddenly, while in chronic cases it may be preceded by a state in which constipation and diarrhea alternate, or by one in which the stools gradually get smaller and smaller in size, possibly over a period lasting for several months. In chronic cases of obstruction to the large intestine, it is not uncommon for the sufferer to possess a constant desire to go to stool with straining pain, though he can pass nothing (tenesmus). In some conditions, particularly that due to intussusception, though there is constipation in the ordinary sense, the excessive straining produces a copious discharge of blood-stained mucus. The swelling of the abdomen varies in different cases. In acute cases the whole belly is blown up with gas, much increasing the pain of the condition. In chronic cases, where the wall of the intestine is thickened, individual loops stand out now and then and become visible on the surface in their attempts to force their contents past the obstruction. When the small intestine is affected its loops stand out one over the other, resembling the rungs of a ladder; while obstruction low down in the large intestine causes a bulging in the flanks and across the upper part of the abdomen.

In addition to these abdominal symptoms, there is generally, in the later stages, collapse, though consciousness is retained till the end. If the condition be not relieved by operation, death almost always results, in acute cases, in the course of three to six days.

Treatment.—In a few cases, as for example in hernia and in intussusception, relief may be obtained by manipulation. But this is dangerous, as it merely relieves the condition temporarily without preventing its recurrence; and it is more satisfactory to perform an operation for radical cure at once.

The following prescription may be tried for temporary relief:

℞ Tincture of Aloes .....one ounce
Tincture of Belladonna .....two teaspoonfuls
Simple Elixir .....one ounce
Mix.
Dose: One teaspoonful every two hours until the patient is relieved.

No food should be given by mouth. Ice may be given to quench thirst. Use hot applications for relief of pain. If vomiting is persistent, wash the stomach out two or three times a day.

Give oil injections (four to six fluid ounces of sweet or castor-oil) through the rectum. Hard rectal accumulations sometimes are removed by the finger or a suitable instrument. If the obstruction is caused by accumulated fecal material, repeated high enemata containing glycerine, turpentine, and Epsom salts are usually successful in giving relief.

PERFORATION OF THE BOWELS

Causes.—This may take place as the result either of injury or of disease. Stabs and other wounds which penetrate the abdomen may damage the bowels and severe blows or crushes may tear them without any external wound. Ulceration, as in typhoid fever, or, more rarely, in consumption, may cause an opening in the bowel wall also. Again, when the bowels are greatly distended above an obstruction, fecal material may accumulate and produce ulcers, which rupture with the ordinary movements of the bowels. Whatever be the cause, the symptoms are much the same.

Symptoms.—The contents of the bowels pass out through the perforation into the peritoneal cavity, and, making their way between the coils of intestine, set up a general peritonitis. In consequence, the abdomen is painful and after a few hours becomes extremely tender to the touch, as a result of the peritonitis. The abdomen swells, particularly in its upper part, owing to gas having passed also into the cavity. Vomiting is a symptom and the person passes into a state of collapse. Such a condition is almost invariably fatal in two or at most three days, if not promptly treated. Occasionally, however, the perforation is preceded by a certain amount of peritonitis, which forms adhesions in the neighborhood of the ulcerated part, so that when perforation finally takes place a localized abscess, instead of general peritonitis, may result, and the person may recover.

Treatment.—All food should be withheld, because whatever is taken into the stomach is either vomited or passes out of the perforation into the peritoneal cavity. Ice may, however, be

given to suck in order to allay thirst and vomiting. An ice-bag is to be placed over the abdomen and hot-water bottles to the feet. Keep the patient quiet until the doctor arrives. An operation is urgently necessary, the abdomen being opened in the middle line, the perforated portion of bowel found, and the perforation stitched up. If the bowels be damaged badly, a part is often cut out and the divided ends joined together. Finally, the peritoneal cavity is thoroughly washed out, and a drainage tube left in the abdominal wound.

APPENDICITIS

Definition.—Appendicitis is the name of an inflammatory disease starting in the appendix vermiformis. Formerly, the condition was wrapped in much obscurity, and its effects attributed to "gastric seizure," "inflammation of the bowels," "iliac phlegmon," "perityphlitis," "paratyphlitis," and conditions under many other names. For long the condition was called "perityphlitis," and supposed to be an abscess formed by infection from the cecum, the blind extremity of the large intestine; and it is now known that in many cases the symptoms are due to inflammation and distention of this structure, the appendix being unaffected. Inflammation of the appendix itself does not constitute the disease; and so long as only the appendix is affected, though there may be discomfort, there is no real pain, the occurrence of acute pain indicating that the peritoneum, the smooth membrane covering all the bowels and lining the abdominal cavity, has become inflamed in that portion which forms the outer covering of the appendix. Not uncommonly a diseased appendix is found by chance in operation for some other trouble, and it may have given rise to no symptoms if its peritoneal covering be glossy and uninflamed. This point is of importance with regard to treatment.

Varieties.—The disease is classified in many ways with regard to its treatment and its anatomical characters. First of all, one must separate the acute from the chronic or *relapsing form.* In the latter the person affected is troubled by repeated slight attacks of pain in the right iliac region, over the shaded area as shown in the figure accompanying the treatment, perhaps never bad enough to keep him from moderate work, but suf-

ficient to be a burden; or there is a sense of constant indefinable weakness and discomfort in this situation. This corresponds probably to a chronically inflamed appendix which has not yet affected its peritoneal covering, to an attack of peritonitis which has been recovered from but which has left adhesions behind, or to a small chronic abscess which has resulted from a past attack. The *acute form* is that which is usually known as an "attack of appendicitis," and, though in ordinary cases it is a localized inflammation of the peritoneum, which tends to get better in about fourteen days, it may proceed to two very serious forms, "*gangrenous appendicitis,*" in which the appendix sloughs away and the bowels communicate through the opening with the peritoneal cavity, and "*suppurative appendicitis,*" in which the appendix becomes the center of an abscess.

Causes.—The disease is said by many authorities to have increased much in the last twenty years, and, if so, it must be owing to some widespread change of social habits, or of diet. *Constipation,* and the retention in the cecum of undigested food, together with overeating, may have a close connection with the onset of an attack. The great modern increase in the habits of tea-drinking and of meat-eating has also been credited as the main factor responsible for the constipation.

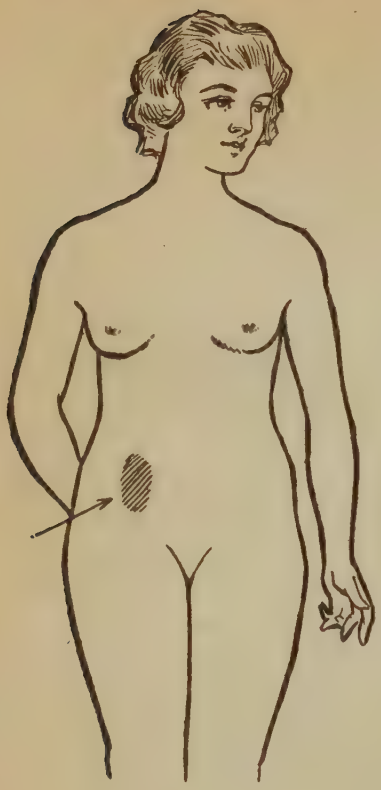
When congestion and inflammation of the appendix or neighboring organs have been started the condition is continued and augmented by the presence of various *bacteria,* that is, bacillus coli, streptococci, etc. The severity of an attack depends largely upon the nature of the bacteria present. A protest must be made against the widespread popular idea that grape-seeds, apple-pits, date-stones, and similar small objects have a special faculty for finding out the appendix, lodging there, and setting up appendicitis. The idea is fallacious, and, though such objects are found there occasionally, these cases are exceptional, and the small masses of hardened feces or minute concretions of lime, which are very common, are a result of, rather than the cause of, the appendicitis. The disease is specially one of *youth,* and eighty per cent. of all cases occur under the age of thirty. Further, the *male sex* is quite disproportionately attacked (also in about eighty per cent. of all cases), and when a female is attacked the occasion is generally at a menstrual period. *Life in the tropics* and *irregularity in meal times* seem both to predis-

pose to it, so that travelers and business men who neglect or bolt their meals are very liable to attacks. In many cases an attack follows closely upon a *strain*, such as may have been caused by lifting a heavy weight, a long cycle ride, or a blow on the abdomen, and in these cases the appendix has been probably for a long time in a state of chronic inflammation, ready to proceed to peritonitis.

Symptoms.—An attack of appendicitis comes on as a rule suddenly, without the early feelings of languor common to most acute diseases. The principal symptoms are four in number: (*a*) Sudden pain in the abdomen, often vague in situation at first, but usually settling, in a day or two, in the right iliac region. It is generally very severe, and the patient has to lie constantly on his back with the right leg drawn up. (*b*) Disturbance of the digestive functions, consisting in loss of appetite, nausea, often vomiting and constipation, which has usually been present for a day or two. (*c*) Tenderness to touch in the right iliac region, which, in very many cases, has its point of greatest intensity defined with curious exactitude at a point called Munro's or M'Burney's point, situated about 2½ inches distant from the spine of the iliac bone in the direction of the navel. (*d*) Fever of a moderate amount, generally about 102°. The first three of these occur in varying intensity in other diseases of the abdomen, in which, however, fever is uncommon. Besides these, distinct swelling is usually visible in the right iliac region after two or three days. In an ordinary case these symptoms last for a week or so and then gradually decrease, leaving the person fairly well at the end of two weeks. In "*gangrenous appendicitis*" the symptoms are extreme, the fever high, and death may come on with startling rapidity, if an operation is not performed. In "*suppurative appendicitis*" an abscess forms, though rarely before the end of the first week, and this also calls for an operation.

In some cases an attack is very slight, the bowels around become matted together, an abscess collects in the cavity so formed, and only when it comes near the surface is the condition diagnosed.

Treatment.—The treatment of an ordinary case is fairly simple, and consists of remedies to allay vomiting, if present, light diet, mainly of milk, and poultices or a hot-water bag applied



over the iliac region as shown by the shaded area in the accompanying figure. If the pain is very severe apply an ice-bag over the same area, instead of the poultice or hot-water bag.

In general no purgatives should be given, for sometimes their use produces very serious results. At the very onset of a case, however, it is often advantageous to relieve the constipation by a saline purge. The case must be intently watched lest serious symptoms set in suddenly, and though opium used to be given to relieve the pain, it is now generally avoided because it conceals the symptoms which point to the necessity of operation. With regard to operation opinion is much divided. Some surgeons go so far as to remove the appendix as soon as appendicitis is diagnosed. The danger of operation is however much greater during an acute attack than during the latent period; the general mortality of the disease being only five per cent. while that of operations performed in the acute stage is about twenty per cent. If, however, the case is one of "gangrenous appendicitis" or of abscess formation, immediate operation is the only proper course; for the great danger of the disease consists in the production of a general peritonitis through the escape of bacteria and putrescent material in large amount from the interior of the appendix.

With regard to treatment after an attack, great care regarding diet and regulation of the bowels is indispensable. Seeing that the mortality of operation to remove the appendix between two attacks is extremely low (only one in five hundred) and that its removal affords complete freedom from future attacks, it is the general opinion that most cases should be so treated. Certainly if a person has had two bad attacks the operation should be performed.

PERITONITIS

Definition.—Peritonitis means inflammation of the peritoneum or membrane investing the abdominal and pelvic cavities and their contained viscera. It may exist in an acute or a chronic form, and may be either localized in one part or generally diffused.

Inflammation of this membrane varies much as regards its causes, severity, and danger, according as it is acute or chronic. Though there are occasional intermediate cases, it may be said, roughly speaking, that the development of acute cases may be reckoned by days, that of chronic cases by months.

Acute Peritonitis.—Like inflammations of other parts, this is said to arise occasionally in consequence of a chill, being of rheumatic nature, but this cause is rare. Much more frequently, it arises in consequence of the entrance of micro-organisms into the peritoneal cavity, which gain entrance through wounds from the exterior, or pass out of some of the abdominal organs. The great danger which follows upon stabs and other penetrating wounds of the abdomen, and the fear which, prior to the days of antiseptic surgery, kept surgeons from operating upon this cavity, originate from the risk of peritonitis. On the other hand, the danger may come from within, and all conditions which lead to perforation of the stomach, bowels, bile-ducts, bladder, and other hollow organs may produce it. Thus gastric ulcer, typhoid fever, gall-stones, rupture of the bladder, strangulated hernia, and obstructions of the bowels may end in peritonitis. Again, abscesses developed in connection with various organs may burst and so produce it, appendicitis and abscesses of the ovary and Fallopian tubes being specially dangerous. Peritonitis may also arise within a few days after delivery, and this puerperal form is a very fatal complication of childbirth.

The changes which take place in the peritoneum are similar to those undergone by other serous membranes when inflamed, viz.: (1) congestion; (2) exudation of fibrine in greater or less abundance, at first grayish in color and soft, thereafter yellow and becoming tough in consistence, causing the folds of intestine to adhere together, and so tending to limit the spread of the inflammation; (3) effusion of fluid, either clear, turbid, bloody, or

purulent; (4) absorption more or less complete of the fluid and fibrine, or, in cases that proceed to a serious issue, the formation of gray or greenish-gray pus. Occasionally shreds or bands of unabsorbed fibrine remain, and become converted into fibrous tissue, constituting a subsequent danger of strangulation of the bowel, though this risk follows more often upon recovery from the chronic form.

In some cases, as already stated, the peritonitis becomes *localized* by adhesions between neighboring organs due to the deposit of fibrine upon their surface. This process takes place with great rapidity, and it makes a good deal of difference in the result of the disease whether it be thus shut into one part of the abdomen or whether it spreads so rapidly, or is of so virulent a type, as quickly to become *general*.

The bacteria causing peritonitis are numerous, but among the most common are the bacillus coli communis, which is always a denizen of the intestine.

Symptoms.—The symptoms usually begin by a rigor, together with vomiting and pain in the abdomen of a peculiarly severe and sickening character, accompanied with extreme tenderness, so that the slightest pressure causes a great aggravation of suffering. The patient lies on the back with the knees drawn up, and it will be noticed that the breathing is rapid and shallow and performed by movements of the chest only, the abdominal muscles remaining rigid, unlike what takes place in healthy respiration. The abdomen becomes swollen by flatulent distention of the intestines, which increases the patient's distress. There is usually constipation. The skin is hot, and the temperature rises to 104° or 105° F., although there may be perspiration; the pulse is small, hard, and wiry; the urine is scanty and high-colored, and passed with pain. The patient's aspect is one of anxiety and suffering. These symptoms may subside in a day or two, but if they do not, the case is apt to go on rapidly to a fatal termination. In such an event, the pain and tenderness subside, the abdomen becomes more distended, hiccough and vomiting of brown or blood-colored matter occur, the temperature falls, the face becomes pinched, cold, and clammy, the pulse exceedingly rapid and feeble, and death takes place from collapse, the patient's mental faculties generally remaining clear till the close. When the peritonitis is due to perforation, as may happen in the

case of a gastric ulcer, or the ulcers of typhoid fever, the above-mentioned symptoms and the fatal collapse may all take place in from twelve to twenty-four hours. Usually the disease lasts four or five days, and the patient sometimes survives as long as a week. The puerperal form of this disease, which comes on within a day or two after parturition, is always very serious, and is often rapidly fatal. The symptoms are similar to those already described, but in addition there are generally superadded those of septicemia.

Treatment.—The patient should lie in a semi-reclining position supported by a back-rest and pillows, with a pillow beneath the knees, so as to bend up the thighs, and a cage over the abdomen to support the weight of the bedclothes. Externally, either an ice-bag or hot fomentations retard the inflammation and give great relief. The food must be fluid, stimulating, and easily digested, and if vomiting comes on cracked ice may be given. In the later stages, when the stomach will not retain even water, large enemata of salt water quench the distressing thirst. Some physicians administer small doses of Epsom salts in the early stages, in order to relieve the constipation which is present and diminish the congestion of the bowels. These doses are repeated at frequent intervals till the bowels move.

The question of operation arises in every case of peritonitis. In cases due to perforation of the stomach or intestine which are discovered early, operation is always advisable, because there is a good prospect of freeing the abdomen from the septic material which has entered it, and, if no operation be performed, the patient will almost certainly die.

Chronic Peritonitis.—This is, in the great majority of cases, tubercular in origin and secondary to consumption, or tuberculous disease of bones, joints, glands, or bowels. There is also a localized form of chronic peritonitis, which is non-tubercular. This latter form is due to long-continued inflammation in an abdominal organ or to ulceration which threatens to perforate. This type of peritonitis is altogether a fortunate thing, because it produces great thickening and adhesions over the part in question, thus lessening the risk of perforation or of infection of the general peritoneal cavity.

Symptoms.—The chief symptoms of tubercular peritonitis are abdominal pain and distention, along with disturbance of the

functions of the bowels, there being either constipation or diarrhea, or each alternately. Along with these local manifestations, there exist the usual phenomena of tuberculous disease, fever, with emaciation and loss of strength. The abdominal pain may, however, be so slight as only to reach a feeling of uncomfortable weight and fullness.

The simple localized form mentioned above is characterized mainly by recurring attacks of sharp pain, and often the thickening of the peritoneum is so great as to simulate and be mistaken for a tumor.

Treatment.—The application of various counter-irritants to the abdomen is practised by some, and the daily rubbing of mercurial ointment into the abdomen has been highly recommended. Surgical intervention is often attended by a cure if the case does not recover within some months under this medical treatment. The usual operation consists in opening the abdomen, allowing the fluid to escape and air to enter the peritoneal cavity, and again closing the wound. This operative treatment seems to be oftener successful if fluid be present in considerable amount than if there be little or none in the cavity.

ACUTE INFECTIOUS DISEASES

GLANDULAR FEVER

DEFINITION.—Glandular fever is a condition which occurs in little epidemics, especially in autumn, among children living in one household or at school together. The glands of the neck, especially of the left side, become, in the course of a day or two, much enlarged and tender, and, at the same time, there is fairly high fever, and the child loses all appetite for food. It appears to be due either to some error in diet or to some irritation of the throat, for example, by inhaling air contaminated by bad drains. The child remains ill for about a week and then the glands slowly subside. This trouble is very often mistaken for mumps, a condition in which the salivary glands are inflamed.

Treatment.—The child should, at first, be confined to bed, and as constipation is generally present, a dose of castor-oil may be given. For the rest the neck should be kept warm and still by a flannel bandage and absorbent cotton, but no further application is necessary, as the glands rarely suppurate. Tonics and careful feeding are necessary afterward, since the general health is a good deal depressed.

℞ Syrup of Ferrous Iodide .....three teaspoonfuls
Peppermint-water .....two ounces
DOSE: One teaspoonful in water, before each meal.

Or:

℞ Emulsion Cod-liver Oil
DOSE: One teaspoonful three times a day, half an hour after meals.

Or:

℞ Fowler's Solution ..... seventy-two drops
Aniseed-water ..... three ounces
Mix.
DOSE: One teaspoonful three times a day, half an hour after meals.

INFLUENZA—LA GRIPPE—EPIDEMIC CATARRH

Definition.—Influenza is a term applied to an infectious febrile disorder of short duration, characterized specially by catarrh of the respiratory passages and alimentary canal, and occurring mostly as an epidemic.

Causes.—This disease is referred to in the works of the ancient physicians, but accurate descriptions of it have been given by numerous medical writers during the last three centuries, in connection with epidemics which have occurred from time to time. In some of the epidemics, influenza has spread through the whole of Europe in the course of six weeks. Wherever it appears, the whole community suffers to a greater or less extent, irrespective of age or condition of life.

Much speculation and some amount of scientific inquiry have been expended in endeavors to ascertain the cause of this remarkable ailment.

Symptoms.—Owing to the fact that almost any organ of the body may be affected in influenza, and that the disturbance produced is rather interference with the functions of affected organs than any destructive change, the symptoms are fairly vague. The most common disturbances consist of a sudden febrile attack, accompanied by a chilly feeling, shivering, headache, and aching pains through the body, followed by the development of sore throat and cough. The onset is so sudden in many cases that the patient can describe what he was doing at the moment he was first affected. Constipation, mental depression, and a feeling of great exhaustion commonly accompany the symptoms named, and last for three to five days, or the attack may be prolonged to several weeks. There is, however, after the feverishness and other symptoms have quite passed off, a very slow return to ordinary appetite and strength. A state of feebleness and easily induced fatigue, lasting for weeks or months after the attack has passed off, is also highly characteristic of influenza. Beyond these general symptoms there are three more or less distinct types of the malady, which shade off imperceptibly into one another, but of which one or other has been most pronounced in different epidemics. These are the types in which the respira-

tory, nervous, and digestive systems respectively are chiefly affected.

Treatment.—Often the enfeeblement and feverishness are so great that the person must perforce take to bed, but it is not at all uncommon for vigorous people to struggle on with their usual work. This is very unwise, because not only is the risk of pneumonia and other serious complications made much greater by this course, but the resulting enfeeblement is greater and lasts longer than if the patient had husbanded his strength. It is a good rule, therefore, to keep in bed as long as the temperature remains high, and, in the case of elderly people, for several days after it has become normal. Salicylate of soda and phenacetine form the favorite remedy for the pains and headache of slighter cases. Quinine is also frequently used. When constipation is present it may be relieved by calomel or castor-oil. In every case, after the attack has passed off, a course of tonic treatment is necessary for the speedy restoration of health and strength.

A hot foot-bath to which powdered mustard has been added has generally a beneficial effect, especially if followed by a hot lemonade.

Cayenne-pepper remedy (red pepper): To one teaspoonful of red pepper add a teacup of boiling water; cover and let it steep for ten or fifteen minutes; then strain through a fine cloth.

Dose: One tablespoonful of this liquid taken in a cup of hot milk or water, every hour or two, has proved an excellent remedy. If taken on retiring, place a hot-water bottle to the feet and cover the patient with blankets to avoid drafts and exposure.

A good-sized dose of quinine, about five to ten grains, taken on retiring, has usually a beneficial effect.

The following prescriptions have been used with good effect:

℞ Phenacetine .....twelve grains
Quinine .....twelve grains
Mix, and put into six capsules.
Dose: One capsule every four hours.

Or:

℞ Salol .....thirty grains
Phenacetine .....one dram
Quinine Salicylate .....one dram
Mix, and put into twenty-four capsules.
Dose: One capsule every three or four hours.

Or:

℞ Powdered Camphor .....five grains
Powdered Cayenne Pepper .....five grains
Sulphate of Quinine .....ten grains
Salol .....ten grains
Antifebrine .....twenty grains
Mix, and put into ten capsules of five grains each.
Dose: One capsule every two hours.

Or:

℞ Quinine Sulphate .....thirty-six grains
Aspirin .....one dram
Mix, and put into twelve capsules.
Dose: One capsule every three or four hours.

Diet.—The food should be of the lightest, particularly in the digestive type of the disease, being limited to milk, rice, or corn-starch, and thin broths. In severe or complicated cases, careful nursing, feeding, and stimulation of the heart's action are specially required.

SPANISH INFLUENZA—"THREE-DAY FEVER"—"THE FLU"

Definition.—This epidemic was brought from Valencia, Spain, in 1647. Since that time there have been numerous outbreaks of the disease, and it is very contagious. Whether the present so-called "Spanish" influenza is identical with the epidemics of influenza of early years is not known at present.

Causes.—Bacteriologists who have studied this disease in the past have found, in many of the cases, a very small rod-shaped germ, called, after its discoverer, Pfeiffer's bacillus. In other cases of apparently the same disease there were found pneumococci, the germs of lobar pneumonia.

No matter what particular kind of germ causes the epidemic, it is now known that it is always carried from person to person, the germs being carried with the air along with the very small droplets of mucus expelled by coughing, sneezing, or forceful talking, by one who already has the disease.

Symptoms.—This disease resembles a very contagious kind of a cold, accompanied by fever, pains in the head, eyes, ears,

back, and a feeling of severe illness. In most of the cases the symptoms disappear after three or four days; in others, pneumonia develops. In some cases, in addition to the above symptoms, there are dizziness, vomiting, chills, and low pulse.

Treatment.—Just as soon as any of the above-named symptoms appear, the patient should take from two to four doses of quinine of five grains each, one hour apart, and on going to bed he should be given a hot bath or a hot mustard foot-bath, and should have a hot-water bottle or a hot iron at his feet, and drink plenty of hot lemonade or hot milk; the bowels should be kept open, preferably by Epsom salts. Any of the following remedies will be found good:

℞ Aspirin .....forty-eight grains
Phenacetine .....twenty-four grains
Salol .....forty-eight grains
Mix, and make into twelve capsules.
Dose: One capsule every three hours.

℞ Acetanilid .....fifteen grains
Aspirin .....seventy-five grains
Mix, and make into fifteen powders.
Dose: One powder every four hours, with a little water.

Dried Raspberries.—Take one tablespoonful of dried raspberries and boil them in two teacupfuls of water; let boil for ten or fifteen minutes; strain, and drink as hot as can be borne. It can be sweetened if preferred. Repeat every three or four hours if necessary.

Camphor.—Put fifteen or twenty drops of spirits of camphor in a teacup of hot water, and drink as hot as possible, especially on going to bed; repeat every two or three hours.

Cayenne Pepper.—Take one teaspoonful of Cayenne pepper and put it in a teacupful of boiling water; cover it and let it remain for ten minutes, then strain through a fine cloth. Take one tablespoonful of this fluid to a teacupful of hot water; repeat every hour or two.

Prevention.—In guarding against this, as well as all other diseases, it is important that the body be kept strong and able to fight off disease germs. This can only be done by taking proper care of yourself. Most of us underestimate the value of fresh air (see Index for fresh-air exercises). After coming from

overcrowded places, such as theaters, churches, schools, and crowded cars, the mouth and nostrils should be sprayed with a solution of salt and water; the former with a strong solution, and the latter with a weak solution. Care should be taken not to inhale the breath from others. At all times, both winter and summer, the windows of the sleeping-room should be opened from top and bottom.

TYPHOID—ENTERIC FEVER

Definition.—Typhoid is a continued fever characterized mainly by its insidious onset, by a peculiar course of the temperature, by marked abdominal symptoms occurring in connection with a peculiar ulceration of the bowels, by an eruption upon the skin, by its uncertain duration, and by a liability to relapses.

This fever has received various names, such as gastric fever, abdominal typhus, infantile remittent fever, slow fever, nervous fever, etc. A clear distinction has been established between the two fevers, not only as regards their symptoms and morbid features, but also as regards their origin. While typhus fever is a disease of overcrowding and poverty, typhoid may occur where such conditions are entirely excluded; and the connection of this malady with contamination of food or water by the bacillus of the disease is now established.

The essential differences between typhoid and typhus are as follows:

GENERAL SYMPTOMS	TYPHUS FEVER	TYPHOID FEVER
Invasion	Rapid	Prolonged
Chill at onset	Frequent	Rare
Bleeding from nose	Absent	Frequent
Pupils	Pinhole size	Normal or dilated
Prostration	Early	Late
Intestinal symptoms	Infrequent	Frequent
Nervous symptoms	Early and severe; violent delirium	Late
Decline of disease	Rapid	Gradual
Eruption	Early, and found also on extremities	Late; none on extremities
Blood examination	No Widal reaction	Widal reaction present

Causes.—It has been completely proved that a bacillus, discovered first by Eberth in 1880, and known as the *Bacillus*

typhosus, is the direct cause of the malady. The bacillus, just as in the case of the poison of other infectious diseases, is not equally hurtful at all times and in all circumstances. Thus where the discharges, sheets, etc., from typhoid patients are carefully disinfected, there is little risk of direct spread from person to person.

Within recent years some cases presenting all the symptoms and morbid signs of a slight case of typhoid fever have been found associated with bacilli closely resembling, though differing in some important tests from, the Bacillus typhosus. To these cases the name of *paratyphoid fever* has been given, and the bacilli are known as "paratyphoid bacilli." The bacillus resides in the stools and urine of typhoid patients, and when these decompose it seems to multiply and to acquire increased virulence. Thus, in badly laid drains, where the contents stagnate, the bacillus may increase indefinitely, and, by the contamination of drinking-water in places where wells or cisterns are exposed to sewage pollution, convey infection to a whole community. Dust may also act as the medium which conveys the bacilli, in cases where the discharges of a typhoid patient or the sewage is allowed to dry, and so get blown into drinking-water or on to food. There is abundant evidence that milk may readily be contaminated by the bacillus and form the cause of an epidemic, when a case of the fever has occurred in a dairy. The source of an epidemic has also been traced to the eating of oysters taken from oyster-beds near which contaminated sewage is discharged. During an epidemic, it can be readily understood that flies may also form a means of contamination between uncovered stools and uncovered food. In almost all cases, therefore, it may be said that the spread of typhoid fever depends upon food or drink contaminated by a bacillus which is derived more or less directly from the discharges of previous typhoid cases.

Typhoid fever is most common among the young, the majority of cases occurring between the ages of fifteen and twenty-five, though it does occur in rare instances at or beyond middle life. It attacks the well-to-do as frequently as the poor. The greater number of cases appear to occur in autumn, and it prevails in all countries, though some of its features may be modified by climate and locality.

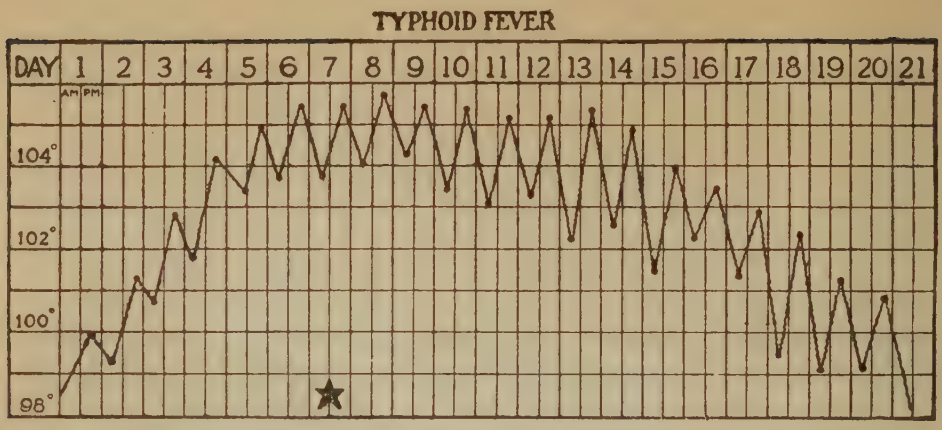


CHART SHOWING ORDINARY COURSE OF TEMPERATURE IN TYPHOID FEVER
The fever rises gradually and stays at high level for a week; then gradually falls to normal.

Symptoms.—The symptoms characterizing the *onset* of typhoid fever are very much less marked than those of most other fevers, and the disease in the majority of instances sets in somewhat insidiously. Indeed, it is no uncommon thing for patients with this fever to go about for a considerable time after its action has begun. The most marked of the early symptoms are headache, lassitude, and discomfort, together with sleeplessness and feverishness, particularly at night; this last symptom is that by which the disease is most rapidly detected in its early stages. Bleeding at the nose is also an early symptom in many cases. The peculiar course of the *temperature* is also one of the most important diagnostic evidences of this fever. During the first week it has a morning range of moderate febrile rise, but in the evening there is a marked ascent, with a fall again toward morning, each morning and evening, however, showing respectively a higher point than that of the previous day, until about the eighth day, when, in an average case, the highest point is attained. This varies according to the severity of the attack; but it is no unusual thing to register 104° or 105° F. in the evening and 103° or 104° in the morning. Although the patient may, during the earlier days of the fever, be able to move about, he feels languid and uneasy; and usually before the first week is over he has to take to bed, and soon the effects of the attack become more apparent. He is restless, hot, and uncomfortable, particularly as the day advances, and his cheeks show a red flush especially in the evening or after taking food.

The *pulse* in an ordinary case, although more rapid than normal, is not accelerated to an extent corresponding to the height of the temperature, and is, at least in the earlier stages of the fever, rarely above 100. In severe and protracted cases, where there is evidence of extensive intestinal ulceration, the pulse becomes rapid and weak, with a dicrotic character indicative of general feebleness. The *tongue* has at first a thin whitish fur and is red at the tip and edges. It tends, however, to become dry, brown or glazed-looking, and fissured transversely, while sordes may be present about the lips and teeth. There is much thirst and in some cases vomiting.

Diarrhea is a frequent but by no means constant symptom. When present, it may be slight in amount, or, on the other hand, extremely profuse, and it corresponds, as a rule, to the severity of the intestinal ulceration, and to the nature of the diet which the patient has been taking. The discharges are highly characteristic, being of light yellow color, resembling pea soup in appearance. Should intestinal hemorrhage occur, as is not infrequently the case during some stage of the fever, they may be dark brown, or composed entirely of blood.

About the beginning or during the course of the second week of the fever, an *eruption* frequently makes its appearance on the skin. It consists of isolated spots, oval or round in shape, of a pale pink or rose color, and of about one to one and a half lines in diameter.

These various symptoms persist throughout the third week, usually, however, increasing in intensity. The patient becomes prostrate and emaciated; the tongue is dry and brown, the pulse quickened and feeble, and the abdominal symptoms more marked; while nervous disturbance is exhibited in delirium and in tremors and jerkings of the muscles. In severe cases, the exhaustion reaches an extreme degree, but even in such instances the condition should not be regarded as hopeless. In favorable cases, a change for the better may be expected between the twenty-first and twenty-eighth days. Convalescence proceeds slowly, and relapses are apt to occur (due frequently to errors in diet). Such relapses may prolong the fever for two or three months, though this is not common.

Treatment.—The preventive treatment includes all the municipal and domestic measures that aim at securing pure sup-

plies of water and milk and well laid drains. Inoculation with anti-typhoid vaccine is a precaution which may well be adopted by persons about to proceed to a country where the disease is rife. When an outbreak of typhoid fever occurs in a family, inquiry should be made at once into all the sanitary matters mentioned as causes, and the source of the milk supply especially should be scrutinized. The discharges of a typhoid patient should be mixed as soon as passed with a strong disinfectant, as carbolic acid five-per-cent. solution. Similar care should be taken to sterilize all sheets, towels, etc., soiled by the patient. Special care is necessary on the part of those in attendance upon a typhoid-fever case to cleanse the hands at once after touching the patient, and especially after they have become in any way soiled by contact with his discharges.

The more prominent symptoms which mark the course of typhoid fever frequently call for special treatment. Thus, when the fever continues long with little break in its course, the employment of remedies to control its action (antipyretics) may often be resorted to with benefit. Such drugs as quinine, salicine, salicylic acid, and salicylate of soda, phenacetine, antipyrine, antifebrine, etc. (in ten-grain doses of one or other), may frequently break in upon the continuity of the fever, and by markedly lowering the temperature relieve for a time the body from a source of waste, and aid in tranquilizing the excited nervous system.

℞ Urotropine .....five-grain tablets
Dose: One tablet in half a glass of water every four hours thoroughly dissolved.

For coated tongue and parched mouth:

℞ Dilute Muriatic Acid .....one-half ounce
Dose: Seven drops in wineglass of water, after meals.

For distention of bowel:

℞ Salol .....five-grain capsules
Dose: One capsule three times a day, with water.

Diet.—Very special care is necessary in typhoid fever with regard to diet. Milk, the great value of which as a fever-food

was first clearly set forth by Gairdner, is of eminent service in typhoid, but it must be administered with due regard to time and to the digestive powers of the patient. When given too frequently or in too great quantity, it may, by its imperfect digestion, prove a source of irritation to the bowels. Even when given with every care it may fail to agree, as is proved by the presence of undigested curd in the evacuations. In such a case, its admixture with lime-water or with peptonizing agents may render its digestion less difficult, but sometimes its use must for a time be suspended. It is, however, rare that milk cannot be borne when carefully administered. Barley-water or simple soups, such as chicken broth, beef tea, etc., are occasionally useful either as substitutes for or in addition to milk. All through the fever the patient should be fed at regular periods—not, as a rule, oftener than once in every two hours—although in the intervals water or other fever-drink may be given from time to time. In convalescence, the diet should still be largely milk and soft matters, such as custards, light puddings, meat jellies, or boiled bread and milk. Solid foods, with the exception of fish, should be for a long time avoided. In changing the diet, it is of importance to note its effect upon the temperature, which may sometimes be considerably disturbed from this cause even after the apparent subsidence of all fever.

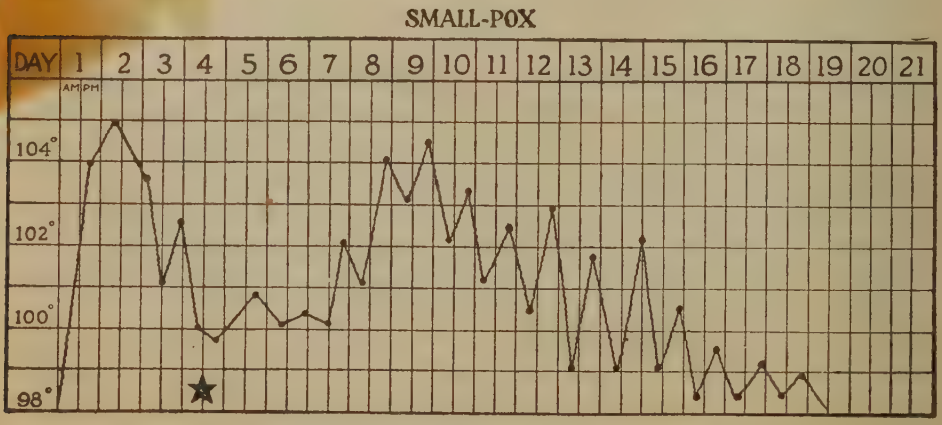
SMALLPOX—VARIOLA

Definition.—Smallpox is an acute infectious disease characterized by fever and by the appearance on the surface of the body of an eruption, which, after passing through various stages, dries up, leaving more or less distinct scars. Although in most civilized countries its ravages have greatly decreased since the introduction of vaccination, yet epidemic outbreaks are far from uncommon, affecting especially those who are unprotected, or whose protection has become weakened by lapse of time.

Causes.—The only known factor in the origin of smallpox is contagion, this malady being probably the most contagious of all diseases. Its outbreak in epidemic form in a locality may frequently be traced to the introduction of a single case from a distance. By far the most common cause of conveyance of the disease is contact with the persons or the immediate surround-

ings of those already affected. The atmosphere around a smallpox patient is charged with the products of the disease, which likewise cling tenaciously to clothing, furniture, etc. The disease is probably communicable from its earliest manifestations onward to its close, but it is generally held that the most infectious period extends from the appearance of the eruption till the drying up of the pustules. Smallpox may also readily be communicated by the bodies of those who have died from its effects. No age is exempt from susceptibility to smallpox. Infants are occasionally born with the eruption or its marks upon their bodies, proving that they had undergone the disease *in utero*. Dark-skinned races are said to suffer more readily and severely than whites. Overcrowding and all unsanitary surroundings favor the spread of smallpox where it has broken out; but the most influential condition of all is the amount of protection afforded to a community by previous attacks and, especially in the present day, by vaccination. Such protection, although for a time most effectual, tends to become exhausted, unless renewed.

Symptoms.—While the symptoms of smallpox are essentially the same in character in all cases, they are variously modified according to the form which the disease may assume, there being certain well marked varieties of this as of most other infectious maladies. The following description applies to an average case. After the reception into the system of the smallpox contagion, the onset of the symptoms is preceded by a period of incubation, during which the patient may or may not complain. This period



TEMPERATURE CHART IN SMALLPOX

In this, the temperature makes two definite waves; the first is short and the second is prolonged.

From Kingsbury Dermachromes, by permission of Rebman Co., N. Y.

SMALLPOX

is believed to be from about ten to fourteen days. In cases of direct inoculation of the virus it is considerably shorter. The invasion of the symptoms is sudden and severe, in the form of a rigor followed by fever (the *primary fever*), in which the temperature rises to 103° or 104° F. or higher, notwithstanding that perspiration may be going on. A quick pulse is present, together with thirst and constipation, while intense headache accompanied with vomiting and pain in the back is among the most characteristic of the initial symptoms. Occasionally the disease is ushered in by convulsions. Some authorities hold that the more violent the invasion the more severe the attack is likely to prove. These symptoms continue with greater or less intensity throughout two entire days, and during their course there may occasionally be noticed on various parts of the body, especially on the lower part of the abdomen and inner sides of the thighs, a diffuse redness accompanied by slight spots of extravasation, the appearance somewhat resembling that of scarlet fever. On the third day, the characteristic eruption begins to make its appearance. It is almost always first seen on the face, particularly about the forehead and roots of the hair, in the form of a general redness; but upon this surface there may be felt by the finger numerous elevated points more or less thickly set together. The eruption, which is accompanied by heat and itching, spreads over the face, trunk, and extremities in the course of a few hours, —continuing, however, to come out more abundantly for one or two days. It is always most marked on the exposed parts; but in such a case as that now described the individual "pocks" are separated from each other. On the second or third day after its appearance, the eruption undergoes a change, the pocks becoming vesicles filled with a clear fluid. These vesicles attain to about the size of a pea, and in their center there is a slight depression, giving the characteristic umbilicated appearance to the pock. The clear contents of these vesicles gradually become turbid, and by the eighth or ninth day of the disease they are changed into pustules containing yellow matter, while at the same time they increase still further in size and lose the central depression. Accompanying this change, there are great surrounding inflammation and swelling of the skin, which, where the eruption is thickly set, produce much disfigurement and render the features unrecognizable, while the affected parts emit

an offensive odor, particularly if, as often happens, the pustules break. The febrile symptoms, which ushered in the disease, undergo marked abatement on the appearance of the eruption on the third day, but on the eighth or ninth, when the vesicles become converted into pustules, there is a return of the fever (*secondary* or *suppurative fever*), often to a severe extent, and not infrequently accompanied by prominent nervous symptoms, such as great restlessness, delirium, or coma. On the eleventh or twelfth day the pustules show signs of drying up (desiccation), and along with this the febrile symptoms decline. Great itching of the skin attends this stage. The scabs produced by the dried pustules gradually fall off and a reddish-brown spot remains, which, according to the depth of skin involved in the disease, leaves a permanent, white, depressed scar, this "pitting" so characteristic of smallpox being specially marked on the face. Convalescence in this form of the disease is, as a rule, uninterrupted.

Treatment.—In the prevention of smallpox, with regard to the safety both of the individual and of the community, no measure has been so effectual as vaccination.

The treatment of cases of smallpox is conducted upon the same general principles as that for the other infectious diseases. The special treatment includes, in the first place, the providing of competent nurses, who, together with all others in the neighborhood of the patient, should be duly protected by recent vaccination. The patient should lie on a soft bed in a well ventilated but somewhat darkened room. The skin should be sponged occasionally with tepid water, and the mouth and throat washed with a solution of chlorate of potash, permanganate of potassium, or other safe disinfectant. In a severe case, with evidence of much prostration, stimulants are required. The patient should be always carefully watched, and special vigilance is called for when delirium exists. This symptom may sometimes be lessened by sedatives, such as opium, bromides, or chloral. With the view of preventing pitting, many applications have been proposed, but probably the best are cold or tepid compresses of light weight kept constantly applied over the face and eyes. The fluid out of which these are wrung may be a weak lotion of carbolic acid (seven drops to an ounce of water), or boracic acid. When the pustules have dried up, the itching thus produced may be much

relieved by the application of oil or vaseline. Complications are to be dealt with as they arise, and the severer forms of the disease treated with reference to the special symptoms presented. In cases where the eruption is slow in appearing, and the disease threatens to assume the malignant form, the wet pack is recommended by an eminent authority. Ventilation should be free, and all clothing, etc., should be afterward burned.

℞ Glycerite of Starch .....two ounces

Directions: Apply to the rash twice a day.

℞ Bromide of Potash .....five teaspoonfuls
Syrup of Sweet Orange .....one ounce
Camphor-water .....six ounces
Mix.
Dose: One tablespoonful without water, to induce sleep.

Or:

℞ Caffeine Citrate .....one-grain capsules
Dose: One capsule every three hours.

Diet.—During the early stages of the disease, before the pustules break and the fever subsides, the diet should be mostly of milk. As the fever declines, starchy foods, toast, and crackers may be added, together with beef juice. When the scabs have formed, a gradual return to full diet is indicated. Fruit juices may also be added with benefit.

MALARIA—AGUE—INTERMITTENT FEVER—MARSH FEVER

Definition.—Malaria, also known as ague, paludism, jungle fever, marsh fever, periodic fever, is a disease caused by the presence of certain parasites in the blood. It consists at first of a series of febrile attacks, which may come on every day, every second day, or every third day; later it assumes a chronic form, in which a bad state of health known as chronic malaria or malarial cachexia is developed, and there is a tendency toward frequent relapses.

History.—The disease has been known from the earliest times, and not only is it described by many of the medical writers of antiquity, but numerous references to it exist in general litera-

ture, such as the works of Horace. From these it appears that its connection with swampy ground was even in ancient times quite well recognized. In 1880 Laveran, a French military surgeon, discovered the presence of minute parasites in the corpuscles of blood drawn from malarious persons and examined under the microscope.

It has long been noticed, even by West African natives, that mosquitoes seem to flourish together with malaria, and several scientists endeavored to establish a connection between the two. This was successfully proved by Manson in 1894, through carrying from Italy live mosquitoes which had been allowed to suck blood from malarious persons in that country, and allowing the insects to bite healthy people in London, who had no other possible connection with the disease.

Causes.—As shown by the above discoveries, the presence of persons infected by the malarial parasite and the access of the Anopheles mosquito to these and to healthy persons form two of the conditions producing infection of fresh cases. But there are various factors which aid or retard the development of the parasite and of the mosquito. The disease is known all round the world, but is chiefly found in tropical climates, spreading here and there into temperate regions, where it occurs in summer and autumn, if the other conditions are suitable.

Symptoms.—For a day or two before the actual fever sets in, there may be headache, vague pains about the body and limbs, chilliness and slight rises of temperature. When the parasites have multiplied up to the stage already mentioned, the attack suddenly comes on.

The acute malarial attack has, in general, three stages, though in occasional cases one of the stages may be excessively marked or may be wanting. These are the cold stage, the hot stage, and the sweating stage.

The cold stage begins with a feeling of chilliness even in the hottest weather. This increases till the person has to betake himself to bed and heap himself with clothes, face and nails blue with cold, and the whole body shaken with shivering. Nevertheless if the temperature be taken with a thermometer, it is found to be considerably raised. This stage lasts an hour or less.

The hot stage comes on as the temperature of the body rises, beginning with hot flushes, which lengthen till the body feels burning hot, the temperature rising to 105° or 106° F. There are also headache, dizziness, sickness, pains throughout the body, and sometimes even delirium. This stage may last several hours.

The sweating stage comes on after the fever reaches its height, as the temperature begins to fall. Profuse perspiration breaks out, the person begins to feel decidedly better, and the headache and pains at the same time pass off. Finally, after two or three hours the patient feels quite well, though much weakened, and remains so till the next attack begins.

If the disease becomes chronic, various symptoms set in. The person becomes very anemic in consequence of the large number of blood-corpuscles destroyed by the parasites in each paroxysm of fever. A feeble state of health, accompanied by bodily wasting and yellow discoloration of the skin, ensues, the liver enlarges by a process of cirrhosis, and the spleen becomes so very large and soft that slight injuries to the abdomen are dangerous on account of risk of rupturing this organ. Dysentery and abscess of the liver are other serious complications which now and then occur.

Treatment.—The successful treatment of malaria has become much more perfect within the last few years, since the true nature of the disease has become fully known, although the use of quinine as a remedy has been known for nearly three centuries. The treatment falls into two important sections—preventive and curative.

Preventive treatment may be directed either against the parasites or against the mosquitoes which convey them. It is generally agreed that if persons who go to a malarious district or country to reside will take regularly every day five or ten grains of quinine, say in the morning, the blood may be rendered so resistant to the development of the parasites that the person is to a large extent protected against malaria, and may escape it altogether. It is still more important to attack the mosquitoes in their developing stage. Petroleum has been recommended as best adapted for this purpose, and when poured upon pools it spreads out instantly into a film which will remain intact

for several days if not destroyed by rain or wind. A fairly large quantity is necessary, and it is calculated by Kerschbaumer that the amount required is about one pint per square yard of water surface, as a result of which all larvæ die within a few hours. Further, all small pools in gardens should be filled up, tubs, flower-pots, cisterns, and other collections of water emptied regularly at least once a week.

Curative treatment depends chiefly upon quinine, but unless the drug be carefully administered it loses much of its effect. In the early stages of the disease, it has most effect if a large dose be taken an hour or thereabout before the expected attack, and in other cases three times a day. In such cases the amount taken is generally about thirty grains each day, but this varies greatly, according to the age of the person and his susceptibility to the drug. When taken for some time in large doses, quinine causes ringing in the ears, temporary deafness, and other unpleasant symptoms.

Quinine is best taken in acid mixture, and this is a point of special importance to those of weak digestive powers. It should be taken at the beginning of a meal, and if these points be attended to, the sickness which is occasionally an annoying result of its administration is generally avoided.

In chronic malaria, quinine is not of so much use as good food, removal to a temperate climate, and other measures directed toward improving the general health. Tonics containing arsenic and iron are of great benefit, and the various complications which arise are treated as in other conditions.

The following have all been used with good effect:

Calomel given in two doses of one grain each, one hour apart, has been found to be of value.

Quinine sulphate given in doses of five grains each, every three hours, is one of the best remedies.

Warburg's tincture has remarkable antimalarial power, and is especially valuable where congestion accompanies malarial paroxysm. It should be given as follows: the bowels of the patient must first be opened thoroughly by a saline purgative, such as Epsom salt; this is to be followed by giving one tablespoonful of Warburg's tincture undiluted, and no other drink is to be taken. After two or three hours another dose of one tablespoonful is to be given in the same way. Shortly after

this a profuse sweat appears, which is often the crisis, and recovery soon takes place.

℞ Fowler's Solution.....one-half ounce
Dose: Beginning with two drops in water before meals increasing one drop each dose until seven drops three times a day are taken. Continue for a period of two weeks if no bad effects are experienced.

Or:

℞ Fluidextract of Nux Vomica.....thirty drops
Water .....six ounces
Dose: One teaspoonful every two or three hours.

Or:

℞ Muriate of Quinine .....twenty grains
Extract of Nux Vomica .....five grains
Powdered Aloes and Reduced Iron,
of each .....twenty grains
Extract of Gentian, a sufficient quantity.
Mix, and make into twenty pills.
Dose: One every four hours.

Or:

℞ Quinine Sulphate .....twenty-four grains
Aromatic Sulphuric Acid .....forty-eight drops
Simple Syrup .....two ounces
Peppermint-water .....two ounces
Mix.
Dose: One-half tablespoonful every three hours.

The following mixture is excellent when fever is high:

℞ Fluidextract of Gelsemium .....one-half dram
Water .....four ounces
Mix.
Dose: One teaspoonful every hour for a few doses, then every two to three hours until fever subsides.

Syrup of figs is excellent for children in doses of one-half to one tablespoonful, as it keeps the bowels open.

CHOLERA

There are two distinct forms of this disease which are included under this general term, namely, simple cholera and malignant cholera. Although they are both essentially different as regards their causes and their pathological relationships, these two dis-

eases in their individual cases may present many symptoms of resemblance. We will endeavor to take up separately each of these two types in this article.

CHOLERA MORBUS—SIMPLE CHOLERA

Definition.—Cholera morbus, also known as summer or autumnal cholera, cholera nostras, choleraic diarrhea, is the cholera of the ancient medical writers, as is apparent from the accurate description of the disease given by Hippocrates and others. It is an acute gastro-intestinal catarrh, characterized by profuse vomiting, purging, and painful cramps. This form of cholera is not contagious.

Causes.—Attacks of this kind are of frequent occurrence in summer and autumn in almost all countries. They appear specially liable to occur when cold and damp alternate with heat. Occasionally the disorder prevails so extensively as to constitute an epidemic. The exciting causes of an attack are in many cases errors in diet, particularly the use of unripe fruit and new vegetables and the excessive drinking of cold liquids during perspiration. Outbreaks of this disorder in a household or community can sometimes be traced to the use of impure water, or to noxious emanations from the sewers. It seems that the condition is largely dependent upon the excessive development of bacteria, under the above-named favorable conditions, in the intestine, though no specific micro-organism, as in the other form of cholera, can be assigned as the cause.

Symptoms.—The chief symptoms in well marked cases are vomiting and purging, occurring either together or alternately. The seizure is usually sudden and violent. The contents of the stomach are first ejected, and this is followed by severe retching and vomiting of thin fluid of bilious appearance and bitter taste. The diarrhea which accompanies or succeeds the vomiting and is likewise of bilious character is attended with severe griping abdominal pain, while cramps affecting the legs or arms greatly intensify the suffering. The effect upon the system is rapid and alarming, a few hours of such an attack sufficing to reduce the strongest person to a state of extreme prostration. The surface of the body becomes cold, the pulse weak, the voice husky, and the whole symptoms may resemble in a striking manner those of

malignant cholera, to be subsequently described. In unfavorable cases, particularly where the disorder is epidemic, death may result within forty-eight hours. Generally, however, the attack is arrested and recovery soon follows, although there may remain for a considerable time a degree of irritability of the alimentary canal rendering necessary the utmost care in regard to diet.

Treatment.—Vomiting should be encouraged so long as it shows the presence of undigested food, after which opiates ought to be administered, and will generally succeed in allaying the pain and diarrhea, while ice and effervescing drinks serve to quench the thirst and subdue the sickness. In aggravated cases where medicines are rejected, enemata of starch and laudanum or the hypodermic injection of morphia ought to be resorted to. However, preparations containing opium can only be secured through prescriptions from the physician. Counter-irritation by means of mustard or turpentine applied over the abdomen is always of use, as is also friction with the hands where cramps are present. When sinking threatens, brandy and ammonia will be called for.

The following prescriptions have been found valuable:

℞ Fluidextract of Blackberry ..... three drams
Aromatic Syrup of Rhubarb .....one ounce
Carbonate of Magnesia .....one dram
Tincture of Ginger .....two drams
Cinnamon-water, to make .....two ounces
Mix.
Dose: One teaspoonful every hour.

Or:

℞ Camphor .....fifteen grains
Oxalate of Cerium .....ten grains
Salol .....ten grains
Salicylate of Bismuth .....twenty grains
Mix, and make into ten powders.
Dose: One powder every three hours.

Diet.—During convalescence the food should be in the form of milk and farinaceous diet, or light soups, and all indigestible articles must be carefully avoided.

ASIATIC CHOLERA—MALIGNANT CHOLERA

Definition.—This is one of the most severe and fatal of all diseases. This form of cholera belongs originally to Asia, more particularly to India, where, as well as in the Indian Archipelago, epidemics are known to have occurred at various times for several centuries. It was not, however, till 1817 that the attention of European physicians was specially directed to the disease by the outbreak of a violent epidemic of cholera at Jessore in Bengal.

About the year 1841 another great epidemic of cholera appeared in India and China, and soon began to extend in the direction traversed by the former, but involving a still wider area. It entered Europe again in 1847, and spread through Russia and Germany on to England, and thence to France, whence it came to America, and subsequently appeared in the West Indies. This epidemic appears to have been even more deadly than the former, especially as regards Great Britain and France.

A third great outbreak of cholera took place in the East in 1850, entering Europe in 1853. During the two succeeding years it prevailed extensively throughout the Continent, and fell with severity on the armies engaged in the Crimean War. Although widely prevalent in Great Britain and Ireland, it was less destructive than former epidemics. It was specially severe in this country and South America.

A fourth epidemic visited Europe again in 1865–66, but was on the whole less extensive and destructive than its predecessors. Cholera has since appeared in the form of limited epidemics in various districts of Russia, Turkey, and Western Asia, while it still continues to maintain its footing in India, where sudden outbreaks are of frequent occurrence, being often connected with the assembling of crowds at native festivals. In 1884, and again in 1892 and 1893, there were outbreaks in the middle of Europe, the last one being specially severe in Hamburg and some other cities, but, apart from occasional cases brought by ship, there has been no epidemic in this country for the past forty years.

Causes.—The direct cause of the disease is now generally admitted to be the spirillum choleræ or "comma bacillus" dis-

covered by Koch. This organism is constantly found in the discharges from the bowels of those suffering from the disease. In this, as in other infectious diseases, a special liability of individuals must be admitted, as is proved by the fact that among persons living under precisely the same conditions, some will suffer while others escape, and also that persons living in cholera districts may come to enjoy an immunity from attacks of the disease. Among predisposing causes the incautious use of purgative medicines, eating of unripe fruit, bad and insufficient food, intemperance, dirt, overcrowding, and all kinds of unfavorable hygienic surroundings play an important part during the course of a cholera epidemic.

Symptoms.—It is customary to divide the symptoms into three stages: a premonitory stage, a stage of collapse, and a stage of reaction, though these are not always so distinct as to be separately recognizable.

The *first stage* consists in the occurrence of diarrhea, which is frequently of mild and painless character, and coming on after some error in diet, is apt to be disregarded. The discharges from the bowels are similar to those of ordinary summer cholera, which the attack closely resembles. There is, however, at first an absence of vomiting.

The *second stage* is termed the stage of collapse or algide stage. It is often preceded by the premonitory diarrhea, but not infrequently it appears without earlier sign. It comes on, often suddenly, in the night, with diarrhea of the most violent character, the material discharged being of whey-like appearance, and commonly termed "rice-water" evacuations. The symptoms of the disease now advance with rapidity. Cramps of the legs, feet, and muscles of the abdomen come on and occasion great agony, while the signs of collapse make their appearance. The surface of the body becomes cold and assumes a blue or purple hue, and the skin is dry, sodden, and wrinkled, indicating the intense draining away, in the evacuations, of the fluids of the body.

In this condition, death often takes place in less than one day, but, in epidemics, cases are sometimes observed where the collapse is so sudden and complete as to prove fatal in one or two hours without any great amount of previous purging or vomiting. In most instances the mental faculties are comparatively

unaffected, although in the later stages there is generally more or less apathy.

Reaction may, however, take place, and this constitutes the *third stage*. It consists in the arrest of the alarming symptoms of the second stage, and the gradual but evident improvement in the patient's condition. The pulse returns, the surface assumes a natural hue, and the bodily heat is restored. Before long, the vomiting ceases, and though diarrhea may continue for a time, it is not of a severe character and soon subsides, as do also the cramps. The urine may remain suppressed for some time, and on returning is often found to be albuminous.

Even in this stage, however, the danger is not past, for relapses sometimes occur which speedily prove fatal; while, again, the reaction may be of imperfect character, and there may succeed an exhausting fever (the so-called *typhoid stage* of cholera), which may greatly retard recovery, and under which the patient may sink at a period even as late as two or three weeks from the commencement of the illness.

Treatment.—The treatment of cholera embraces those sanitary measures requisite for preventing as far as possible the introduction of the disease into localities previously unaffected, or for checking its spread when introduced, as well as the special medical management of those who have been attacked.

Preventive Treatment.—When cholera threatens to invade any place, however favorably circumstanced as to its hygienic condition, increased vigilance will be requisite on the part of those entrusted with the care of the public health. Where the disease is likely to be imported by ships, quarantine regulations will be necessary, and, where practicable, measures of isolation should be adopted in the case of individuals or companies of people coming from infected localities, more especially if they have, or have recently had, any symptoms of cholera in their own persons.

The utmost care will be demanded, particularly in populous districts, in cleansing and disinfecting places where accumulations of animal refuse are apt to occur. The condition of the drinking-water and of the wells in which it is collected will always require inspection, as will also the quality of the food supplied, more especially to the poor. Where suspicion attaches to the water, it should be boiled before being used, and the same holds true of the milk.

Every article of clothing which has been in contact with a cholera patient should be burned or sterilized, while infected apartments should be thoroughly disinfected by scouring with perchloride-of-mercury solution or fumigation with formaldehyde. The early burial of those dying from cholera is obviously a matter of urgent necessity, and it has been recommended that the body of a cholera patient should be surrounded by a mixture of lime, charcoal, and carbolic acid. It would be better still, in epidemics, if all bodies were cremated within twenty-four hours of death.

Curative Treatment.—With regard to the treatment of individuals sick of cholera, it may be safely affirmed that as to no other disease has so much difference of opinion prevailed, or so many extravagant notions been entertained regarding the value of remedies. There is a want of agreement as to fundamental principles of treatment; for while astringents have been regarded by some as their sheet-anchor, others have condemned them as worse than useless, and rely on the elimination of the *materies morbi* by means of laxatives. In the earlier period of the attack, for the cholera diarrhea the use of opium is of undoubted value. Given alone in small and oft-repeated doses, or in combination with other astringents, such as catechu, tannin, bismuth, nitrate of silver, or acetate of lead, it frequently succeeds in quelling this symptom, and thus arresting the disease at the outset. Strict confinement to bed and the administration of bland drinks such as milk, barley-water, and beef tea, along with counter-irritation to the abdomen, will be found valuable aids to treatment. In the second stage of cholera, opium is of less value, and other remedies are called for. The violent vomiting and purging and the intense thirst may be relieved by iced effervescing drinks; while, at the same time, endeavors should be made to maintain the heat of the body by friction with stimulating liniments or mustard to the surface, and by enveloping the body in flannel and surrounding it with hot bottles.

Irrigation of the bowel, by means of an enema tube, with a two-per-cent. solution of tannin in hot water, has been highly recommended, and several pints of fluid may be introduced into the body in this way.

The chief modern advance, however, in the treatment of this disease, which indeed has reduced the mortality in some places

to half its previous figures, is the method of injecting "hypertonic" salt solution into the veins. This method, introduced by Rogers, consists in taking the specific gravity of drops of blood extracted from time to time from the finger; and if the specific gravity rises above 1063, of injecting a solution of salt, double the normal concentration of the blood, into a vein. As a result, fluid transudes back from the bowel into the tissues and thence into the blood, and the diarrhea comes to an end. Several pints of this highly concentrated saline fluid are thus injected.

In some epidemics in China the success of this form of treatment, in reviving persons desperately ill and apparently moribund, has been surprising.

For the relief of the cramps the inhalation of chloroform is recommended. Stimulants, such as ammonia and brandy, must be had recourse to, when these measures fail to establish reaction and the patient threatens to sink. When reaction occurs and the vomiting ceases, liquid food in small quantities should be cautiously administered.

℞ Iodoform .....two teaspoonfuls
Olive-oil .....two ounces
Mix.
Directions: Place on ice, and when cold inject a tablespoonful into the rectum.

℞ Calomel .....quarter-grain tablets
Dose: One tablet every hour until twelve doses have been taken.

℞ Salol .....one-half teaspoonful
Bismuth Subnitrate .....four teaspoonfuls
Camphor-water .....three ounces
Mix.
Dose: One teaspoonful without water, every two hours, until diarrhea ceases.

Diet.—All food should be absolutely withheld until the vomiting has ceased for forty-eight hours. Then, sherry wine, whey, or kumiss in doses of a wineglassful every two hours may be given. After diarrhea has stopped, beef juice or extract may be added, followed later by rice, tapioca, arrowroot, corn-starch, etc. White meats may be resumed about the fifth day of convalescence.

GLANDERS—FARCY

Definition.—Glanders, or farcy, also known as equinia, is a specific infectious disease to which certain animals, chiefly those possessing an undivided hoof—such as horses, asses, and mules—are liable, and communicable by them to man, though oxen and swine are, curiously, quite immune to the disease. The term "farcy" is also used to designate a variety of the disease in which the lymphatic glands are first and chiefly affected; but there is no pathological distinction between farcy and glanders, in which the skin and mucous membranes mainly suffer.

Causes.—Glanders is happily a rare form of disease in man, there being evidently less affinity for its development in the human subject than in the equine species. It occurs chiefly among those who from their occupation are frequently in contact with horses, such as grooms, coachmen, cavalry soldiers, veterinary surgeons, etc., and seems always produced either by direct inoculation of the virus from a diseased animal into the broken skin, or by the respiration of air containing the poison. It is said to have occasionally been transmitted from man to man, but such an occurrence is extremely rare.

The direct cause of glanders is an organism, the *bacillus mallei,* which was discovered in 1882 and has been demonstrated to be the cause by artificial production of the disease, through its means, in animals.

Symptoms.—A period of incubation, lasting from three to five days, generally follows the introduction of the virus into the system. The first symptoms are a general feeling of illness, accompanied with pains in the limbs and joints resembling those of acute rheumatism. An ulcer is formed at the point of inoculation, which discharges an offensive fluid, and blisters appear in the inflamed skin, along with diffuse abscesses, as in phlegmonous erysipelas. Sometimes the disease stops short with these local manifestations, but more commonly goes on rapidly, accompanied with symptoms of grave constitutional disturbance. Over the whole surface of the body there appear numerous red spots or pustules, which break and discharge a thick purulent or sanguineous fluid. Besides these, there are larger swellings lying deeper in the subcutaneous tissue which at first are ex-

tremely hard and painful, and to which the term farcy "buds" or "buttons" is applied. These ultimately open and become extensive sloughing ulcers.

The mucous membranes participate in the same lesions as are present in the skin, and this is particularly the case with the interior of the nose, where indeed, in many instances, the disease first of all shows itself. This organ becomes greatly swollen and inflamed, while from one or both nostrils there exudes a copious discharge of highly offensive purulent or sanguineous matter. The disease extends into the throat, mouth, and eyes, while the whole face becomes swollen, and the lymphatic glands under the jaws inflame and suppurate. In the acute form of the disease recovery rarely occurs, and the case generally terminates fatally in a period varying from two or three days to as many weeks.

A chronic form of glanders and farcy is occasionally met with, in which the symptoms, although essentially the same as those above described, advance much more slowly and are attended with relatively less urgent constitutional disturbance.

Treatment.—In the treatment of this malady the main reliance is to be placed on the maintenance of the patient's strength by strong nourishment and tonic remedies. If the point of inoculation of the virus can be early made out, its active cauterization, or the complete excision of the wound, should be resorted to. The opening of abscesses antiseptically, as well as the use of antiseptic lotions for the affected mucous membranes, is recommended.

℞ Zinc Chloride Solution, 10%.....four fluid ounces
DIRECTIONS: Apply to open sores and then dress with iodoform powder.

℞ Sodium Benzoate .....ten-grain capsules
DOSE: One capsule in water, every three hours.

In suspected cases, the disease can be greatly modified or cured by the administration of an antitoxine, mallein, hypodermically, as in the case of diphtheria. This should be given by the physician.

ERYSIPELAS—ST. ANTHONY'S FIRE—ROSE—WILDFIRE

Definition.—Erysipelas is a contagious disease characterized by diffuse inflammation of the skin, or of the subcutaneous cellular tissue, attended with fever. Two kinds of this disorder are recognized: *traumatic* erysipelas, which occurs in connection with some wound or external injury, and may thus affect any part of the body where such lesion may exist; and *idiopathic* erysipelas, in which no connection of this kind can be traced, but which appears to arise spontaneously, and most commonly affects the face and head. The two are known, however, to be due to the same cause, and it is probable that the organisms causing the idiopathic form gain access either through a small abrasion too trifling to be noticed, or from the small glands opening through the skin.

Causes.—It has long been known that the disease is of a highly infectious nature. This contagiousness of erysipelas in its traumatic form was often illustrated in the surgical wards of hospitals, where, having once broken out, it was apt to spread with great rapidity, and to produce disastrous results. Various predisposing factors, however, may exist. Thus persons who are the subject of diabetes, chronic alcoholism, or Bright's disease are specially susceptible to contract it when the skin is wounded. The peculiar liability of women after childbirth to virulent attacks of erysipelas has been already mentioned. Personal uncleanliness and poor diet have also much to do with the onset of the disease.

Symptoms.—When the erysipelas is of moderate character, there is simply a redness of the skin, which feels somewhat hard and thickened, and upon which there often appear small vesicles. This redness, though at first circumscribed, tends to spread and affect the neighboring sound skin, until an entire limb or a large area of the body may become involved in the inflammatory process. There is usually considerable pain, with heat and tingling in the affected part. As the disease advances, the portions of skin first attacked become less inflamed, and exhibit a yellowish appearance, which is followed by slight scaling off of the cuticle.

Erysipelas of the face usually begins with symptoms of gen-

eral illness, the patient feeling languid, drowsy, and sick, while frequently there is a distinct rigor followed with fever. According to some observers the fever is symptomatic of inflammation already begun in the neighboring lymphatic vessels and glands before the appearance of the disease on the skin. Sore throat is sometimes felt, but, in general, the first indication of the local affection is a red and painful spot at the side of the nose or on one of the cheeks or ears. Occasionally it would appear that the inflammation begins in the throat and reaches the face through the nasal fossæ. The redness gradually spreads over the whole surface of the face, and is accompanied with swelling, which, in the lax tissues of the cheeks and eyelids, is so great that the features soon become obliterated and the countenance wears a hideous expression. While the disease progresses, besides the pain, tenderness, and heat of the affected parts, the constitutional symptoms are very severe. The temperature rises often to 105° F. or higher, and there is great gastric disturbance. Delirium is a frequent accompaniment. The attack in general lasts for a week or ten days, during which the inflammation subsides in the parts of the skin first attacked, while it spreads onward in other directions, and after it has passed away there is, as already observed, some slight scaling off of the skin.

Treatment.—In the majority of cases, attention to the functions of the stomach and bowels, with a diet consisting of plenty of easily digested food, is sufficient, and the only local treatment necessary is to dust the affected part with flour, or, better, with a mixture of starch powder and boric acid powder, and to wrap it in absorbent cotton, so as to prevent exposure to changes of temperature. In more serious cases where the person is highly fevered and exhausted, food of a stimulating kind is necessary, and strong soups with the various kinds of meat extracts may be given. As a rule, alcohol is to be strictly forbidden. When the pain is very great, as, for example, in erysipelas of the scalp, hot fomentations may be applied instead of the absorbent cotton.

A very successful means of treating early cases and preventing their further development consists in smearing on several times daily a mixture of ichthyol (1 part) in glycerine (5 parts), over which absorbent cotton is placed and changed each time

the ichthyol is renewed. Another method, often adopted in early cases, is to apply lunar caustic, or blistering fluid, just beyond the edge of the erysipelatous area, a procedure which is supposed to check the spread of the disease through causing the lymph spaces to become blocked.

A recent method of treatment consists in the use of a special serum, but though this "antistreptococcic serum" has been beneficial in many cases, its use has been, on the whole, disappointing. In prolonged cases a vaccine is sometimes used for hypodermic injection.

Where constitutional symptoms are present, the diet should consist of milk, egg-nog, meat extracts, toast, crackers, and fruit juices. No alcoholic stimulants should be given unless the patient becomes exhausted. When the fever subsides, a gradual return to full diet may be made.

Cranberry poultice.—A poultice made of cranberries, applied over the area affected, has in many cases given relief where all other remedies have failed.

Nitrate of silver.—This has been found excellent in preventing the spread of the local disease when applied as a ten-per-cent. solution. Apply with a brush over the edge of the diseased skin, letting it overlap on the healthy skin.

Cantharides (*Spanish fly*).—A plaster of cantharides, applied over the affected area, often gives relief.

Iodine.—Painting the diseased surface with tincture of iodine has often been found beneficial.

White lead painted over the inflamed surface and protected from the air by a layer of cotton and gauze has been found excellent.

Baking-soda.—Spread a thick paste of baking-soda between gauze and place over the inflamed area; this must be remoistened as soon as dry.

Lemon juice and brandy.—Keep the inflamed area moistened with a mixture of one part lemon juice to two parts brandy.

Carbolic acid.—Moisten the area affected with a two-per-cent. solution of carbolic acid.

Ichthyol ointment.—Apply ichthyol ointment over the inflamed area. If the skin is broken, wash the wound with a solution of salt water, using one teaspoonful of table salt to a cup of water.

Witch-hazel.—Bathe the affected area frequently with witch-hazel.

℞ Ichthyol .....four drams
Glycerine .....two drams
Ether .....two drams
Mix.
Directions: Apply locally over the area affected.

℞ Carbolic Acid .....two drams
Tincture of Iodine .....two drams
Alcohol .....two drams
Spirits of Turpentine .....one dram
Glycerine .....three ounces
Mix.
Directions: Apply with a brush to the affected area and surrounding parts every few hours; cover with a layer of cotton to keep out the air. It will arrest inflammation and allay the pain.

℞ Ichthyol .....one dram
Carbolic Acid .....thirty drops
Burow's Solution .....thirty drops
Zinc Salve .....one ounce
Mix and make into salve.
Directions: Apply over the affected area.

℞ Tincture of Iron Chloride .....one ounce
Syrup of Tolu .....one ounce
Solution of Potassium Citrate .....four ounces
Mix.
Dose: One to two teaspoonfuls every three or four hours.

℞ Tincture of Benzoin .....one-half ounce
Rose-water Ointment .....one-half ounce
Mix.
Directions: Apply freely over the area affected.

℞ Zinc Oxide .....one dram
Lard .....one ounce
Mix.
Directions: Apply locally over the area affected.

The following mixture is valuable if taken as soon as a chill sets in:

℞ Tincture of Aconite, 10% .....thirty drops
Water .....four ounces
Mix.
Dose: One teaspoonful every fifteen minutes until perspiration sets in; after this reduce to one teaspoonful every hour if the fever is high, until it comes down to normal.

The following tonic should be taken in conjunction with the above:

℞ Tincture of Iron Chloride .....five drops
Water .....four ounces
Mix.
Dose: One teaspoonful in a wineglassful of water immediately after meals.

When there is much fever, ten drops of the tincture of aconite taken every three or four hours will have a beneficial effect.

When there is much pain of a shooting nature, five to ten drops of the tincture of belladonna taken two to three times a day will be found valuable.

If blisters appear, apply equal parts of Burow's solution and water in the form of a compress over the affected area.

When the joints are attacked and painful take one tablespoonful of infusion of bryonia three or four times a day.

To prevent spreading of the affected area, paint the margin of the inflammation with tincture of iodine.

LEPROSY

Definition.—Leprosy is a chronic disease which affects particularly the skin, mucous membranes, and nerves, causing their invasion at various parts by granulation tissue, and leading to loss of vitality in the affected parts to which the diseased nerves are distributed.

History.—Leprosy is a disease of great historical interest, both because of its strange nature and terrible effects, and still more because it was one of the few diseases recognized and described by ancient writers apart from mere symptoms. Partly

owing to the very marked outward deformities which it produces, and partly because it affected persons of every rank and station, leprosy was regarded with great dread, and the stringent measures taken against it formed the earliest development of preventive medicine. The disease was certainly held in great fear and detestation by the Jews, as may be judged by the strict inspection of suspected lepers, and by the cruel measures and rigid exclusion from society enforced against those who were adjudged by the priest to have contracted the disease.

The disease appeared in Western Europe before the sixth century A. D., as is proved by many incidental references before this time, while from this date to the tenth century various enactments, and the existence of leper hospitals, show that the disease was viewed with great concern, and that it had by then extended as far west as Ireland and Wales.

Causes.—It may be said at once that, although the cause of this disease has attracted the keenest interest from the earliest times, nevertheless, on account of the slow development of the symptoms and the apparent complexity of the conditions which underlie infection, the problem of how the malady spreads from person to person is still unsolved. A bacillus was discovered by Hansen in 1874, which is supposed to be the actual cause of the changes in the body, and as it is always found in great numbers in the diseased tissues and in the secretions of lepers, though nowhere else, it is generally accepted that this *bacillus lepræ* produces the disease. How the bacillus gets from person to person, and what are the conditions necessary for its growth in a body into which it has been introduced, have still to be explained.

The fact that many persons come into intimate contact with lepers for years, and yet do not become affected, is not strange, when one reflects that the same applies to the closely allied disease tuberculosis, and, in a lesser sense, to all infectious diseases.

These facts go toward proving that the disease is undoubtedly contagious, though the risk of contagion from contact with lepers is comparatively slight, and that other circumstances are necessary to infection. It can apparently take place through the clothes of lepers, for cases have been recorded of persons who have worn a coat or lived in a house previously used by a leper, and who have contracted the disease, although they had never

come into contact with his person. Poverty, dirt, and bad food appear to be important factors, for the Norwegian peasants, who live in a state of squalor, and among whom the disease is widespread, shake off the liability to it when they migrate to the happier conditions of life found in the United States. Sex is an important factor, for it is found that, in most places where the disease occurs, three men are affected to every woman.

Symptoms.—There are two distinct types of leprosy: the nodular or tuberculated form, in which the disease produces irregular thickenings of the skin; and the anesthetic or mutilating variety, in which the nerves are affected, causing loss of sensation over large areas, white patches on the skin, and death of outlying parts of the body. There may also be mixed cases, in which the two are combined.

In the *nodular form*, a state of general bad health and feverishness may precede the beginning of the disease. The first characteristic sign is the appearance of red blotches on the face and ears, or on the limbs. These deepen gradually in color and become raised above the surface, but after a time they fade again, though they seldom disappear completely. After a lapse of some weeks or months, a fresh eruption appears, and fades, and this is repeated many times, each attack leaving the skin more irregular and thickened than it was before the attack. Finally, the face and limbs become studded with nodules from the size of a pea to that of a pigeon's egg, which give the face a repulsive and "lion-like" appearance. These nodules form also within the mouth and air-passages, causing blockage of the nose and huskiness or complete loss of voice. Some of the nodules sooner or later ulcerate, and this, spreading to the eyes, frequently causes blindness. The internal organs after a few years become affected, and it is not uncommon for consumption to appear in addition. Finally, after five or ten years of suffering the leper dies.

Nerve-leprosy begins more insidiously with pains in the limbs and faint blotches where the skin loses its pigmentation. Later these blotches increase in size, become white in color, the hair upon them first changing to white, and then falling out, while sensation both to touch and to pain is lost over wide areas. For this reason, severe burns and wounds are often sustained through the leper being unable to feel painful sensations. Later, muscu-

lar weakness and paralysis in various parts of the body appear, due also to implication of nerves, and the special feature of this form of the disease consists in the shriveling up or dropping off of toes, fingers, or even larger portions of the limbs, owing to loss of vitality. In this process, unsightly ulcers and horrible deformities are produced, but the lease of life to the sufferer is long, many lepers surviving for twenty or thirty years.

Treatment.—Naturally the chief object in the treatment of so hopeless a disease is to prevent its spread, and throughout the whole history of the malady the separation of lepers from the healthy has been more or less stringently enforced. There are many leper villages, but the people from these are free to come and go, and to trade with their healthy neighbors. Probably, if the restrictions on their movements, and prohibition of the use by healthy people of articles made by lepers, were more rigidly enforced, leprosy would not be so widespread in some countries. Children born in leper communities should certainly be at once removed from the source of infection. All the remedies proposed for leprosy, after it has obtained a hold, have been of little use. Those measures which are of special benefit in tuberculosis, viz., fresh air, plentiful food, healthy surroundings, and personal cleanliness, help to prolong the leper's life and mitigate his sufferings considerably. Chaulmoogra oil taken internally and applied to the surface of the body has enjoyed some reputation. Gurjun oil has also been tried in India. Arsenic, mercury, iodide of potash, salicylate of soda, etc., have also been used. Nastin, a fat dissolved out of certain bacilli, has recently been administered along with benzoyl chloride, with, it is said, good results.

HYDROPHOBIA—RABIES

Definition.—Hydrophobia is an acute and very fatal disease which affects the lower animals, particularly carnivora, and may be communicated from them to man. In animals it is known as rabies.

Cause.—The disease appears to be in existence constantly among dogs and wolves in some countries, and from these it spreads widely now and then in epidemics. Thanks to the enforcement of muzzling, it has been practically stamped out. It

is highly infectious from the bite of an animal already affected, but the chance of infection from different animals varies. Thus only about one person in every four bitten by rabid dogs contracts hydrophobia, while the bites of rabid wolves and cats almost invariably produce the disease. Bites on exposed parts, like the face, are more dangerous than those through the clothes. It seems to be developed particularly about the brain and spinal cord; and indeed the test, as to whether a dog which has died suffered from rabies, is to inject a preparation made from part of its brain into another animal, and to watch the latter for signs of the disease. The saliva of infected animals is also highly poisonous.

Symptoms.—In animals there are two types of the disease, "mad" rabies and "dumb" rabies. In the former, the dog runs about, snapping at objects and other animals, unable to rest; in the latter, which is also the final stage of the "mad" type, the limbs become paralyzed, and the dog crawls about or lies still.

In man the wound of the bite heals naturally, and then a period of three to six weeks passes before signs of the disease show themselves. It has been said that over a year may elapse before the disease develops, and certainly cases occur in which there is an interval of many months. The commencement of the disease is shown by mental symptoms, the person becoming irritable, restless, and melancholy. At the same time, feverishness and difficulty of swallowing gradually come on. After a couple of days or so, the irritability passes into a state of wildness or terror, there is great difficulty in swallowing either food or drink, and breathing becomes difficult. The flow of saliva is great, and therefore the patient is constantly spitting, and has a dry, short cough, which has given rise to the popular idea that he barks like a dog. A loud noise, a bright light, and particularly any attempt to drink are sufficient to throw the person into a convulsion, and from this fact the disease receives its name. Finally, about four days after the onset of the disease, the patient dies of exhaustion. Recovery seldom, if ever, takes place in untreated cases.

Treatment.—The best treatment is, of course, preventive, and this may be attained by strict muzzling regulations and the slaughter of all animals bitten by, or coming in contact with,

rabid dogs. If a person has been bitten by a dog supposed to be rabid, the dog should not be killed at once, but should be carefully isolated for a week, by which time he may be pronounced healthy or rabid, and, in the latter case, means may be taken to treat the bitten person without delay. When a person is bitten by a dog undoubtedly rabid, a ligature should at once be tied between the wound and the body, so as to check circulation, and the bite should be cut out, burned with a hot iron, or nitric acid, and dressed with wet antiseptic dressing.

Pasteur Treatment.—In 1885 Pasteur introduced a method of treatment which consists of injecting the bitten person with an emulsion made from the spinal cord of a rabbit killed by rabies. These injections, to be successful, should be begun within the first week after the bite, and they are repeated every day for about two weeks, commencing with a spinal cord in which the poison has been rendered very weak by drying, and using each day a cord which has been less and less dried, till the person becomes immune to the full strength of the poison. Though this treatment occasionally fails, it has been successful in thousands of cases.

When the bitten person develops the disease, all that can be done is to quiet the convulsions by bromides, chloroform, and similar drugs.

TYPHUS FEVER

Definition.—Typhus fever is a continued fever of highly contagious nature, lasting for about fourteen days, and characterized mainly by great prostration of strength, severe nervous symptoms, and a peculiar eruption on the skin. Typhus fever would seem to have been observed in almost all parts of the world; but, although not unknown in warm countries, it has most frequently prevailed in temperate or cold climates.

Causes.—The causes concerned in its production include both the predisposing and the exciting. Of the former, the most powerful of all are those influences which lower the health of a community, especially overcrowding and poverty. Hence this fever is most frequently found to affect the poor of large cities and towns, or to appear where large numbers of persons are living crowded together in unfavorable hygienic conditions, as

has often been seen in prisons, workhouses, etc. This disease is now much less common than formerly, being limited in general to the most unsanitary part of some of the largest cities. This fact must mainly be ascribed to the great attention which in recent times has been directed to improvement in the sanitation of towns, especially to the opening up of crowded localities so as to allow the free circulation through them of fresh air. Typhus is highly contagious throughout its whole course and even in the early period of convalescence. The contagion, however, is rendered less active by the access of fresh air; hence this fever rarely spreads in well aired wards or houses where cases of the disease are under treatment. As a rule, one attack of typhus confers immunity from risk of others, but numerous exceptions have been recorded.

Symptoms.—The course of typhus fever is characterized by certain well marked stages. (1) The stage of *incubation*, or the period elapsing between the reception of the fever poison into the system and the manifestation of the special evidence of the disease, is believed to vary from a week to ten days. During this time, beyond feelings of languor, no particular symptoms are exhibited.

(2) The *invasion* of the fever is in general well marked and severe, in the form of a distinct shivering, or of feelings of chilliness lasting for hours, and a sense of illness and prostration, together with headache of a distressing character, and sleeplessness. Feverish symptoms soon appear and the temperature of the body rises to a considerable height (103° to 105° F)., at which it continues with but little daily variation until about the period of the crisis. The tongue, at first coated with a white fur, soon becomes brown and dry, while sordes (dried mucus, etc.) accumulates upon the teeth; the appetite is gone, and intense thirst prevails. The bowels are, as a rule, constipated, and the urine is diminished in amount and high-colored.

(3) The third stage is characterized by the appearance of the *eruption*, which generally shows itself about the fourth or fifth day or later, and consists of dark red (mulberry-colored) spots or blotches varying in size from mere points to three or four lines in diameter, very slightly elevated above the skin, at first disappearing on pressure, but tending to become both darker in hue and more permanent. They appear chiefly on the abdomen,

sides, back, and limbs, and occasionally on the face. After the appearance of the eruption, the patient's condition seems to be easier, so far as regards the headache and discomfort which marked the onset of the symptoms; but this is also to be ascribed to the tendency to pass into the typhus stupor which supervenes about this time, and becomes more marked throughout the course of the second week.

(4) A *crisis* or favorable change takes place about the end of the second or beginning of the third week (on an average the fourteenth day), and is marked by a more or less abrupt fall of the temperature and of the pulse, together with slight perspiration, a discharge of urine, the return of moisture to the tongue, and by a change in the patient's look, which clears up and shows signs of returning intelligence. Although the sense of weakness is extreme, convalescence is in general steady and comparatively rapid.

Treatment.—The treatment of typhus fever includes the precautionary measures of attention to the health of the more densely populated parts of towns. The treatment of a typhus patient is conducted upon the same general principles as in other fevers. The patient should be strictly isolated and must be carefully nursed throughout the illness, the nurse keeping a careful record of the temperature and other observations, the times of feeding and the form of nourishment administered, as well as every other fact noticed for the physician's information. Careful attention must be given to the ventilation and cleansing of the sick-room. The main element in the treatment of this fever is good nursing, and especially the regular administration of food, of which the best form is milk, although light plain soup may also be given. Headache is with many a very distressing symptom, but may be mitigated by removing the hair and applying cold to the head. It is a well recognized rule that persons suffering from typhus fever ought not to be moved in bed for any purpose after the first few days. Cold sponging of the hands, feet, and exposed parts, or cold to the head may often considerably lower the temperature. Throughout the whole progress of a case the condition of the bladder requires special attention, owing to the patient's drowsiness, and the regular use of the catheter becomes, as a rule, necessary with the advance of the symptoms.

Diet.—The regular administration of milk, with the occasional addition of light skimmed soups, beef broth, and beef jelly, should be followed until about the fourteenth day, when the fever subsides. Then a gradual return to full diet should follow, by the addition of rice, corn-starch, and baked potato, to be further increased by white meats and later by red meats, eggs, etc.

ANTHRAX—WOOL-SORTER'S DISEASE

Definition.—Anthrax is a name used for two diseases which resemble each other slightly. One form affects the internal organs, and the other form appears on the skin. The latter will be described here. It is a very serious disease occurring in South American and Australian sheep and cattle, and in those who tend them or handle the skins and fleeces, even long after removal of the latter from the animals. It has also broken out occasionally in epidemics among wool-sorters or cattle-tenders.

Causes.—The cause is a bacillus (*Bacillus anthrâcis*) which grows in long chains and produces spores of great vitality. These spores retain their life for years, in dried skins and fleeces; they are not destroyed by freezing, nor by five-per-cent. carbolic lotion, nor, like many bacilli, by the gastric juice. The disease is communicated from a diseased animal to a crack in the skin, or, when it occurs in busy commercial centers, from contact with skins or fleeces. Nowadays skins are handled wet, but if they are allowed to dry, so that dust laden with spores flies off and is inhaled by the workers, an internal form of the disease results.

Symptoms.—*External form.* This is the "malignant pustule." After inoculation of some small wound, a few hours or days elapse, and then a red, inflamed swelling appears, which grows larger till it covers half the face or the breadth of the arm, as the case may be. Upon its summit appears a blister of pus, which bursts and leaves a black scab, perhaps half an inch wide. There is at the same time great prostration and fever.

Internal form.—This takes the form of pneumonia with hemorrhages, when the spores have been drawn into the lungs, or of ulcers of the stomach and intestines, with gangrene of the spleen, when they have been swallowed. It is usually fatal in two or three days.

Treatment.—Prevention is most important by disinfecting with superheated steam all contaminated fleeces, and all fleeces coming from a district where the sheep have anthrax. All hides should be handled wet, so that spores cannot fly about in dust; for the internal form is four times as fatal as the external. The hands of workmen must be carefully washed before eating, and working-clothes changed. The external form is treated by opening up the pustule, or cutting it right out while it is small, and cauterizing the wound or applying strong antiseptics. The internal form must be treated by supporting the strength and stimulating the vital powers of the patient till it passes off or death occurs.

Antianthrax serum, injected intravenously and repeated at intervals of one to three days, until symptoms subside.

Internally:

℞ Sodium Thiosulphate .....four teaspoonfuls
Water .....four fluid ounces
Mix.
Dose: One tablespoonful in water, every six hours.

PLAGUE—BUBONIC PLAGUE—PESTILENCE

Definition.—Plague is the name of an infectious epidemic disease common to man and many of the lower animals. Its main characters are fever, swelling of the lymphatic glands, a rapid course, and a very high mortality, which has made it a much-dreaded scourge. In the Middle Ages it was known as the Black Death, which again and again ravaged Europe, though for the past century it has been almost confined to warm climates. The disease had not invaded our country till recent years, when it broke out in San Francisco, and it also occurred in Mexico, Brazil, and the Argentine Republic. Still more recently it has broken out in Mauritius, South Africa, and Australia.

Causes.—The disease is probably always present (endemic) in certain localities, such as in the southwest of China, among the hill-people of India, and parts of East Africa. From these homes it spreads outward at intervals, sometimes creeping from village to village, at other times being disseminated widely along trade-routes.

The bacillus (*Bacillus pestis*) which is the immediate cause was discovered by Kitasato, a Japanese scientist, in 1894. It is found in the enlarged lymphatic glands, and in all the secretions and discharges, as well as in the blood of some cases. Rats are undoubtedly responsible for conveying the disease from house to house and from ships to shore. It has been shown that one mode in which rats infect human beings is by fleas, which leave the dead rats, and by their bites inoculate the bacillus into persons who afterward become affected. This was proved to be the case by experiments carried out for the Bombay Plague Committee.

Symptoms.—A graphic description of the symptoms of the disease is given by Defoe in his "Story of the Great Plague," through which he lived as a child in London in 1664–65.

After infection, an incubation period, varying from two to eight days, elapses, and then the disease sets in suddenly with fever, headache, great lassitude, and aching of the limbs. The temperature soon rises to 103° F., or more, the skin is hot and dry, the tongue furred, while thirst, prostration, and a feeling of utter weakness assail the sufferer. His features become drawn, his eyes sunken, and he sinks off into a state of stupor or passes sometimes into wild delirium. There is often also sickness and vomiting.

In over two thirds of all cases there are swollen glands, known as "bubos," from which the malady has received the name of "bubonic plague." These are situated most commonly in the groins, less frequently in the armpits, and give sometimes the first sign that the person has contracted the plague. There are also hemorrhages under the skin in many cases, which sometimes produce black gangrenous patches that lead to large ulcers, hence the old name of "Black Death."

In favorable cases the fever abates at about the end of a week, the strength gradually returns, and the bubos soften, burst, and discharge foul-smelling pus.

There is a rapidly fatal form, associated with great weakness, in which the bacteria enter the blood, and the person dies on the second or third day, sometimes even in a few hours, before the bubos have time to form.

In other cases the lungs especially become affected, and pneumonia comes on, with death on the fourth or fifth day. This is

said to be both the most infectious and the most fatal form of the disease.

In all epidemics, especially at the beginning and end of the epidemic, slight cases occur, in which the persons continue to go about, the bubos being almost the only sign of the malady. The matter from the bubos of such slight cases is, nevertheless, infectious, and these cases are therefore specially dangerous to other people.

Treatment.—Preventive treatment is all-important in this disease. The quarantine system consists in detaining ships which have arrived from an infected port till any persons on board who may have contracted plague shall have had time to show the disease.

In time of plague, or when plague is approaching, a war of extermination should be waged against rats and mice. The bodies should also be carefully examined because it is found that rat-plague in a given district or house is followed later by plague among the human inhabitants.

Personal protection is gained by good feeding, and by living in bright, well ventilated rooms or out of doors. The use of antiseptics for the hands and of disinfectant mouth-washes is important for those nursing the plague-stricken, and special precautions must be taken to seal up any small wounds on the hands, etc., and so guard against inoculation.

A kind of protective inoculation, similar to vaccination against smallpox, has been successfully tried, but is of doubtful practical value.

The treatment of cases actually suffering from plague consists of good nursing, the administration of strychnine and other stimulants to tide the patient, if possible, over the week of the disease, morphia to relieve pain, and surgical handling of the bubos.

Haffkin's Prophylactic Treatment.—Vaccine: 45 to 75 drops subcutaneously, repeated in about two weeks, creates an immunity for about six months. Not used in those who have the disease.

Yersin's Curative Serum.—Subcutaneously injected, about 500 drops daily; in severe cases, given intravenously.

Diet.—During the first week the diet should be supporting, such as kumiss, whey, milk, carbonic water, and meat broths. As

soon as the fever has lowered, in about a week, the diet should be increased by the addition of starchy foods, toast, soups, and a return to full diet by the end of the second week.

SLEEPING SICKNESS

Definition.—This is a disease occurring among natives and Europeans resident in West and Central Africa, the upper Nile basin, etc., characterized by increasing weakness, lethargy, and a constant tendency to sleep, with gradual emaciation and finally death.

Cause.—The cause is found in a microscopic parasite, the *Trypanosoma gambiense,* which is conveyed from the blood of animals to that of man by the bite of a particular species of tsetse fly, the *Glossina palpalis.* The trypanosoma produces its effects by developing in the blood and lymphatic systems and causing inflammation round the minute vessels of the brain.

Symptoms consist simply in gradually increasing dullness and lethargy, with neglect of eating and other bodily necessities. Thus the affected person becomes weak and emaciated. At the same time the lymphatic glands, especially those of the neck, painlessly enlarge. Finally the devitalized frame succumbs to inanition or to some intercurrent disease after the lapse of months or years.

Treatment.—Prevention consists in, as far as possible, segregating affected persons in fly-proof houses, so as to prevent the tsetse flies—the carriers of the disease—from becoming infected with the parasite. Unaffected persons should be careful not to expose their legs and hands to be bitten, and where tsetse flies are numerous it may be necessary, although uncomfortable, to wear thick gloves and veils constantly. White clothing is to be recommended in preference to dark, because it has been long observed that the tsetse fly, like many other insects, does not care to settle on it. The outlook when the disease has started is not favorable, because so far no drug is known which will certainly kill off the parasites in the blood, although the use of atoxyl and other substances may be efficacious if treatment is commenced in the very earliest stages. This drug is always administered by means of a syringe, being injected under the skin or into the muscles.

DENGUE—BREAK-BONE FEVER—DANDY FEVER

Definition.—Dengue, also called break-bone fever, dandy fever, and three-day fever, is a disease of hot climates all round the world, in India, Asia Minor, West Indies, America, Australia, etc. It is a sudden and short infectious fever, characterized mainly by swelling and pains in the joints, and by eruptions.

Cause.—It is epidemic and infectious, very much like influenza, but, beyond this, the cause is not known.

Symptoms.—It begins usually with suddenness by pain in a joint and fever. Next appears redness of the face, spreading later over the body, very much like the rash in scarlatina. There are also sore throat and running of the eyes, and the muscles and joints generally become very painful. These symptoms endure for about three days, and then gradually pass off, leaving the person very weak. After two or three days a relapse generally takes place, very similar to the first attack, except that the rash more resembles that of measles. There may be a third or even a fourth relapse, and recovery from the weakness and pains in the joints is often very slow, lasting over months. Death hardly ever occurs.

Treatment.—Salicylate of soda, or phenacetine, relieves the pains and reduces the temperature. If the fever be marked, liquor ammoniæ acetatis (Mindererus spirit), in tablespoonful doses, with spirit of nitrous ether in teaspoonful doses, may be given three or four times in the day, and cold sponging of the limbs and body is very beneficial. During convalescence, tonics and a light but plentiful diet are necessary.

℞ Sweet Spirits of Niter .....one ounce
Dose: One teaspoonful in a little cold water, every three hours.

YELLOW FEVER—YELLOW JACK—BLACK VOMIT

Definition.—Yellow fever is an acute disease of certain tropical localities, characterized by fever and jaundice.

Distribution.—The disease has a curious geographical limitation. It is endemic in the West Indies, some parts of the Spanish

Main, such as at Vera Cruz and Rio de Janeiro, and in West Africa. In Europe, the disease has from time to time invaded some of the Portuguese and Spanish ports, but it has never gained any permanent hold. When cases of yellow fever arrive at British or other northern European ports, no spread of the disease takes place. It is also quite unknown in the Far East.

Causes.—Every person sick of yellow fever becomes a center for the spread of infection. Much was done by the Army Commission to determine the nature of the poison. It exists undoubtedly in the blood of yellow-fever patients during the first three days of the fever, is carried in general from one case to another by the bite of the *Stegomyia calopus* mosquito, and is of so minute a size that it can pass through the pores of some fine unglazed porcelain filters, and is invisible with the most powerful microscope constructed. It appears, like the malaria parasite, to go through some phase of its development in the body of the mosquito, though the blood of one yellow-fever patient is also directly infectious to another.

Apart from the direct cause, many factors are of known importance in assisting to spread the disease or to render it more severe. Thus all epidemics take place during the hot season, and it is much more dangerous for a susceptible person to visit some center of yellow fever during the hot months than during the cooler ones.

Symptoms.—Different cases vary greatly in severity, but the disease is apt to be especially serious during the prevalence of an epidemic or when it affects persons newly arrived from healthier parts.

Two stages are usually described in a severe case. The *first stage* begins suddenly with headache, chill, pains in the back and limbs and rise of temperature. Vomiting also comes on, the tongue is furred, and the bowels are constipated. A very important point is that the urine decreases in amount, and, if tested, is found to contain albumin, the result of inflammation of the kidneys. These symptoms last for about three days and then sometimes abate to some extent and the patient appears better.

The *second stage* begins usually about the fourth day. The patient now becomes very weak and the "black vomit" comes on. This consists in bringing up constantly from the stomach

a clear fluid containing black flakes formed of blood that has been acted upon by the gastric juice. Although this black vomit is regarded as an alarming sign, it is by no means an index that the patient is sure to die. Jaundice also appears with the second stage, and is the symptom to which the disease owes its name.

Treatment.—*Preventive treatment* is important, and consists of quarantine for persons arriving from an infected locality till the incubation stage of the disease (eight days) is passed; the sick must be kept for the first three days of illness in rooms protected by mosquito-netting, so that they may not infect mosquitoes which would pass on the disease to healthy persons. Burning sulphur is the best means for killing them. The disease has been eradicated from the Panama Canal zone by American enforcement of these methods.

Curative treatment must be directed toward checking symptoms as they arise. Vomiting is allayed by sucking ice or sipping iced water, and by the administration of dilute hydrocyanic acid in doses of two drops in water. Food should be, to a great extent, withheld in the early stage, though the patient may have plenty of water in small drafts. Later on, the only food should be milk, thin soups, and similar liquid nourishment. When the patient is greatly prostrated alcohol must be given, and, of this, champagne is the most approved form. The high temperature which sometimes shows itself is relieved by sponging or by the wet pack. One of the most important symptoms to treat is stoppage of the urine, and for this hot-air baths are employed, as in acute Bright's disease. To keep the kidneys active, give fifteen to twenty grain doses of citrate of potassium or acetate of potassium three or four times a day.

℞ Chloroform-water .....eight ounces
Dose: Two tablespoonfuls every two hours until vomiting ceases.

℞ Quinine Hydrochloride .....one teaspoonful
Cocoa Butter .....two teaspoonfuls
Mix, and divide into six suppositories.
Directions: Insert one each night, to reduce temperature.

BLACK-WATER FEVER

Definition.—This is a disease which occurs in some of the Southern States, in Central Africa, the West Indies, and in some parts of southern Europe, and in which the urine is dark red or black from blood pigment.

Causes are not certain. Some look upon it as of a malarial nature, others as due to overdosage with quinine for malaria. After one attack, relapses are very liable to occur.

Symptoms.—These are fever, high temperature, pains all over the body and bilious vomiting. After a few hours the temperature falls, there is profuse sweating, and the skin becomes jaundiced. Mild cases may recover in a day or two. Severe cases have a succession of attacks, and perhaps a third of all cases result in death.

Treatment.—Small doses of quinine, salicylate of soda, and, if the sufferer become very weak, strychnine and stimulants are given. Drinking of copious amounts of water does good.

℞ Sodium Salicylate .....five-grain tablets
Dose: One tablet every three hours.

Or:

℞ Tablets Strychnine Sulphate....one-sixtieth grain
Dose: One tablet three times a day, half an hour after meals.

RELAPSING FEVER—FAMINE FEVER—FEBRIS RECURRENS

Definition.—Relapsing fever is a continued fever occasionally appearing as an epidemic in communities suffering from scarcity or famine. It is characterized mainly by its sudden invasion, with violent fever, which continues for about a week, ends in a crisis, but is followed in another week by a return of the fever.

Causes.—Relapsing fever is highly contagious and is believed to be caused by a spirillum discovered by Obermeier, and always to be found in the blood of persons suffering from the disease.

Whether this organism be the direct cause or not, destitution, overcrowding, and uncleanliness appear to be the usual predisposing causes.

Symptoms.—The incubation of the disease is about one week after infection. Then the symptoms come on suddenly with shivering, pains in the limbs, and headache. The temperature rises high (105°–107° F.), and there are intense thirst, furred tongue, bilious vomiting, and occasionally jaundice. There is great weakness. After these symptoms have lasted five to seven days, the temperature suddenly falls to normal, and the patient feels well and may even return to work. In another week, however, the same set of symptoms returns, and there may be third and even fourth relapses, usually, however, of a milder type.

Treatment is the same as that for typhus fever, but the disease is not a highly fatal one.

℞ Quinine Sulphate .....five-grain capsules
Dose: One capsule every three hours.

Or:

℞ Urotropine .....five-grain tablets
Dose: One tablet in half a glass of water, after each meal thoroughly dissolved.

MALTA FEVER—ROCK FEVER

Definition.—Malta fever, also known as Mediterranean fever, rock fever, Neapolitan fever, and gastric remittent fever, is a long-continued fever which occurs on the shores and islands of the Mediterranean principally, but is found also in many tropical countries.

Causes.—The disease chiefly affects young men, and is as common among the rich as among the poor, coming on chiefly during the summer months. The direct cause is now known to be the *Micrococcus melitensis,* which is constantly found in the organs of those who die of the fever, and the principal means by which it spreads is in the milk from infected goats. Since this fact became known the disease has greatly decreased.

Symptoms.—For the first week or so, the person has headache, loss of appetite, constipation, and a feeling of tenderness over the liver and spleen, which are both enlarged. There is gen-

erally cough also, and the person perspires freely. Later, fever comes on and may resemble either that of typhoid or that of malaria in type, and it may be very difficult to distinguish a case of Malta fever especially from typhoid. Malta fever lasts a very long time, its average duration being about three months, during which time the fever continues, the sweating is very profuse, the person gets extremely thin and weak, and rheumatic affections in the joints appear. The convalescence is equally tedious, but death very seldom occurs, only about one case in fifty being fatal.

Treatment.—The disease has practically been abolished from Malta by ceasing to use goat's milk. Treatment is directed toward relieving the sleeplessness, pain in the joints, and other symptoms. The strength must also be supported by careful dieting, and during convalescence removal to a cool climate quickens recovery.

℞ Sodium Bromide .....one teaspoonful
Sodium Salicylate .....one teaspoonful
Mix, and divide into six powders.
Dose: One powder every three or four hours for sleeplessness.

EPHEMERAL FEVER—FEBRICULA—MILK FEVER

Ephemeral fever is the name given to a slight feverish attack, which often comes on about the third or fourth day after childbirth in consequence of constipation, tension of the breasts, or other trifling cause. It lasts only for a day or so, hence its name.

Five or six drops of tincture of aconite given in water every two or three hours will reduce the fever. The constipation should be remedied at once by giving the patient a dose of Epsom salts.

DIPHTHERIA

Definition.—Diphtheria is the term applied to an acute infectious disease, which is accompanied by a membranous exudation on a mucous surface, generally on the tonsils and back of the throat or pharynx.

Causes.—There is no doubt that the disease is generally conveyed by direct contagion, as by kissing an affected person, using his cup or spoon, or receiving a drop of saliva or fragment of membrane upon the lips or face through incautiously approaching him when he is coughing. The contagious nature of the disease is also exemplified in the case of medical men who have fallen victims to inoculation with its morbid products while examining the throats of, or performing tracheotomy upon, those suffering from it, especially in cases where, in the course of this operation, an attempt has been made to dislodge the false membrane by sucking the wound.

Symptoms.—In general, following an incubation period of about two days after infection, symptoms set in like those commonly accompanying a cold, such as chilliness and depression. Sometimes very severe disturbances usher in an attack, such as vomiting and diarrhea. A slight feeling of uneasiness in the throat is experienced along with some stiffness of the back of the neck. When looked at, the throat appears reddened and somewhat swollen, particularly in the neighborhood of the tonsils, the soft palate, and upper part of the pharynx, while along with this there is tenderness and swelling of the glands at the angles of the jaws. The affection of the throat spreads rapidly, and soon the characteristic exudation appears on the inflamed surface in the form of grayish-white specks or patches, increasing in extent and thickness until a yellowish-looking false membrane is formed. This deposit is firmly adherent to the mucous membrane beneath, or is incorporated with it, and, if forcibly removed, it leaves a raw, bleeding, ulcerated surface, upon which it is reproduced in a short period. The appearance of the exudation has been compared to wet parchment or washed leather, and it is more or less dense in texture. It may cover the whole of the back of the throat, the cavity of the mouth, and the posterior nares, and may spread downward into the air passages on the one hand and into the alimentary canal on the other, while any wound on the surface of the body is liable to become covered with it. But it is usually limited to part of the area named above.

Treatment.—The patient should be placed in a well ventilated room, in a clean bed, the room being kept moderately warm. No one should be allowed in the room except the nurse. To counter-

act the odor, it is well to place in the room dishes of chloride of lime and vinegar.

It is well to give at the beginning of the disease a small dose of citrate of magnesia or Rochelle salts. Tincture of chloride of iron is also used extensively. Twenty drops every three hours is the dose for an adult.

An excellent prescription is as follows:

℞ Chlorate of Potassa .....one dram
Tincture of Chloride of Iron.....two drams
Glycerine .....one ounce
Peppermint-water .....three ounces
Mix.
Dose: One tablespoonful every three hours.

To sustain the strength of the patient, the sulphate of quinine in doses of a grain every two or three hours is recommended.

Note.—A more extensive treatise on the subject of Diphtheria is given in the department on Children's Diseases.

PELLAGRA

Definition.—Pellagra is an endemic chronic disease, especially occurring among the peasants of southern Europe, but spreading of recent years in the Southern States and in Central and South America.

Causes.—The cause has been attributed both to eating of diseased maize and to a parasite.

Symptoms.—The symptoms are increasing dyspepsia, nervous and mental changes, and especially redness and swelling followed by thinning of the skin over exposed parts, such as the hands and feet, where a cutaneous eruption appears in the spring and subsides in the winter.

Treatment.—Recovery is rare in cases of long standing. The course of the disease is from seven to twenty-one years. Improvement of sanitary conditions and of environment, and a better supply of food, are the best methods of prevention. Medicine is usually used only in treating the various symptoms as they arise.

Arsenic internally has gained commendation and distinction

in this disease, and may be used with advantage in the following formula:

℞ Fowler's Solution .....one ounce
Dose: Five drops in a wineglass of water, three times a day, after meals for two weeks.

The following can also be taken in conjunction with the above:

℞ Salol .....five-grain tablets
Dose: One tablet with a little water, to be taken every three hours.

Diet.—The diet should contain plenty of meat, with fats in fair amount. Milk should be given very cautiously because of bowel disturbance. Fish is very good, but not too much at one time.

FRAMBESIA, YAWS, OR PIAN

Definition.—This is a disease of the tropics, especially of Africa and the West Indies, affecting both white and black races. It consists in the appearance of small tumors covered with yellow crusts, scattered over the surface of the body.

Cause.—The disease is directly contagious from person to person, and the infection is probably also carried by flies, and certainly by clothing and by the unclean huts of the natives.

Symptoms.—The disease does not appear for a fortnight or more after infection, and during this time fever, malaise, pains, and itching of the skin may come on. It begins as a scaly eruption about the body and legs, in which small lumps form and grow till they reach a size even of several inches in diameter.

Treatment.—The important point in treatment is to place the person in healthy surroundings, and feed him well. Various medicines, of which iodide of potash is chief, are given to aid the absorption of the tumors.

℞ Potassium Iodide .....five teaspoonfuls
Peppermint-water .....four ounces
Mix.
Dose: One teaspoonful in water every four hours.

℞ Saturated Solution of Potassium Iodide .....one fluid ounce
Dose: Ten drops in water, three times a day after meals.

The following prescription may be used to relieve the itching:

℞ Calamine Lotion with Phenol....eight fluid ounces
DIRECTIONS: This is applied to the skin with a soft rag.

PREVENTION OF INFECTION

As children are much more liable to contract infectious diseases than grown-up people, attempts to prevent the spread of these diseases are specially directed toward separating affected children from healthy persons. The measures taken apply particularly to schools, which form the places of dissemination in a large proportion of cases, but the rules applicable to children may well be practised with regard to persons of any age and in respect of any public institution.

1. The following diseases may, for this purpose, be considered infectious: *chicken-pox, diphtheria, Liberty measles* (*German measles*), and *epidemic roseola, measles, mumps, ophthalmia, ringworm, scarlatina, smallpox typhoid fever, typhus fever,* and *whooping-cough.*

2. Persons who have contracted any of these diseases should not again mix with the public till the following periods have elapsed:

Chicken-pox, when all the scabs have fallen off, particular attention being paid to the scalp.

Diphtheria, four weeks from the beginning, provided there is no sore throat, nor any discharge from throat, nose, eyes, or ears, and that the diphtheria bacillus cannot be found in the throat.

Liberty measles (*German measles*) and *epidemic roseola,* not less than ten days after the rash appeared.

Measles, not less than two weeks after the rash appeared, but then only if the cough has ceased.

Mumps, not less than three weeks after the beginning, and then only if all swelling has been gone for a week.

Ophthalmia, not until the redness of the eyes has disappeared, in one or two weeks, should the same washing utensils be used by the patient and by other people. In case of trachoma, the child should be permanently removed from school.

Ringworm of the head, not until all bare patches and broken

hairs showing the fungus have disappeared, as tested by careful examination. After ringworm of the body, infectiveness disappears when the skin has become smooth again.

Scarlatina, not less than six weeks after the rash appears, and then only if all discharges from nose, ears, or suppurating glands are stopped, and the surface of the body has been disinfected.

Smallpox, not until all the scabs have fallen off.

Typhoid fever, not less than six weeks from the beginning of the fever, and then only if there have been no relapses.

Typhus fever, not less than four weeks from the beginning.

Whooping-cough, not less than five weeks from the beginning of the whooping, and then only provided that the cough has ceased.

3. After persons have been in contact with the following serious diseases, viz., *diphtheria, scarlatina, typhoid fever, typhus fever,* and *smallpox,* they should remain in quarantine for periods exceeding the longest possible incubation period, viz.: diphtheria, twelve days; scarlatina, ten days; typhoid fever, twenty-three days; typhus fever, fourteen days; smallpox, sixteen days. It is essential, however, that the clothes of the suspected person should be disinfected at the *beginning* of the quarantine period.

After contact with the slighter diseases, viz., *measles, Liberty measles* (*German measles*), *chicken-pox, whooping-cough,* and *mumps,* children attending large schools where infection would spread easily should be isolated, after careful disinfection of their clothes. But in the case of adults and of children living at home, it suffices if they at once take up residence in an uninfected house, and, though mixing freely with other persons, report daily to a physician for a few days before and after the end of the incubation period of the disease to which they have been exposed. Instead of the "contacts" changing their abode, the patient is usually removed, and the sick-room, together with all clothing that has been in contact with him, is disinfected. By these means, if "contacts" become infected, the fact will be recognized within a day, and they can at once be isolated and treated.

4. Clothes, books, etc., which have been used by an infected person, must, when his illness is at an end, be destroyed or carefully disinfected before use by anyone else.

DISEASES OF MEN

ACUTE URETHRITIS—GONORRHEA

DEFINITION.—This is a contagious and inflammatory disease of the urethral mucous membrane. It is caused by a definite micro-organism. It is the most common disease of venereal origin.

The germ was discovered in 1880 by Albert Neisser, and physicians refer to it as a "Neiss infection." Bacteriologically, the germ is a diplococcus.

The period of incubation, that is, the time from inoculation to the appearance of the first symptom, varies from three to seven days, and occasionally the symptoms may show up at the end of two weeks. The length of time depends on the resistance of the patient and the severity of the germ. In cases where the symptoms appear late, it means that the patient is in good condition and was able to withstand the disease for a long time. If the symptoms appear within one or two days, it means that the patient was weak and the germ was very virulent. In this latter class belong men who strain themselves at the time of inoculation, thus giving the germ free access to the glands.

Symptoms.—The onset is first noticed by an itching of the head of the penis. This is followed by a reddening of the orifice, and a stinging sensation develops on urination. The lips of the orifice are usually stuck together, and a yellow discharge may be seen on examination. This discharge gradually increases and becomes pure pus, and this flows from the orifice night and day. After ten days' duration the discharge becomes greenish and flows continuously.

Within one or two days after the discharge begins, other symptoms appear from the irritation of the genital tract. The whole external genital region becomes swollen and tender to the touch. The mere moving of the organ is very painful and sharp

pains occur without apparent cause. Before the passage of urine in the morning hours the pains are very severe, and they are unbearable during an erection.

The symptoms remain at this stage far into the third week; the inflammation has now spread to the back part of the urethra. By this time the general health of the patient is affected. There is a feeling of general weakness, with slight fever and a sensation of fullness or pressure in front of the rectum. At the beginning of the fourth week a mild attack of acute gonorrhea begins to show improvement. There is a change in the discharge; it becomes very thin and gradually decreases. During the sixth and seventh weeks there is only a small drop of discharge seen in the morning, and at the end of one week more the discharge stops.

This is a fairly typical description of the greater number of cases, but many will be disappointed because the discharge or pain does not stop at the end of the sixth week. This may be due to the person considering himself cured and stopping treatment when the discharge ceases; or it may result from the poor general health of the patient, allowing the germs to go deeply into the muscular tissue.

At times the posterior part of the urethra is involved, and this is evidenced by a desire to pass water frequently; this becomes very urgent, giving the patient much distress. In these cases the muscular spasm may be constant, and occasionally blood appears in the urine. This is of no account, but the patient becomes very much distressed and alarmed. In certain cases with involvement of the posterior parts there may be little pain, which is only increased by micturition or defecation. In this type of case nocturnal emissions are common, and the patient may lose control of the bladder, thus wetting his clothing continuously. The patient, unless very careful in treatment, will develop a very sallow complexion, a slight amount of fever, and become obstinately constipated.

There is no definite picture to this disease. In some cases the symptoms may be greatly intensified. If the whole penis becomes involved, the inflammation spreads to the glands and the general health is greatly affected. The discharge is very abundant and may contain blood. Extreme sexual irritation is a very prominent condition associated with this form.

In a number of cases the attack may be mild from the start. The period of incubation and the stage of onset last longer; the inflammation is less intense and there may be no general symptoms, as fever, depression, and constipation. The discharge in this type of case rarely becomes pure pus; it remains very thin throughout. This condition is taken too mildly by the general public, and is always certain to involve the posterior urethra, causing chronic gonorrhea or gleet, inflammation of the prostate, and occasionally gonorrheal rheumatism.

Diagnosis.—The basis of this is a history of definite exposure, a period of incubation together with symptoms of the system being involved. As several germs are known to cause a similar inflammation with discharge, it is very important to have a microscopic test made and thus determine what germ is causing the inflammation. This test is performed by some of the pus being spread on a glass slide; colored dyes are now added and the slide examined under the microscope.

Of late, the public are being educated in regard to the importance of gonorrhea. It has been a prevalent idea among the laity that this disease has no serious complication. Although it rarely results fatally itself, its complications not infrequently end in sterility, the loss of an important joint, permanent damage to the kidneys, or blindness.

For years the germ may linger in the urethra of an unsuspecting victim and thus later on in life infect an innocent wife, inflicting on her those terrible ovarian difficulties which so commonly result. For the above reason, gonorrhea should be classed among the most serious maladies of the human race. It is almost impossible to give a definite limit to duration of the discharge. It is rare that a person recovers in less than six weeks.

Treatment.—The modern methods of treating this disease are based on the discovery of the germ causing the infection. Although many of the old remedies are still in use, their effect on this cannot be explained. As soon as the diagnosis is verified by examination, the patient should be advised in regard to his manner of living during the attack. He should first be instructed about the contagiousness of the disease and the danger of infecting his own eyes or the eyes of those with whom he may come in contact. This is a very serious danger,

because people are apt to grow careless as the disease progresses. Occasionally both eyes become involved, and the patient may eventually lose the sight of both eyes. The discharge from the orifice should be received on a small piece of cotton which may be tucked into the prepuce or placed in a small bag which is tied around the waist. A convenient form of protection is known as the gonorrheal apron. This consists of a small bag fastened about the waist by tapes, and the penis is introduced into it through a hole on the side next to the body; this is filled with absorbent cotton, which is removed and destroyed from time to time, as it becomes soiled. A button flap on the front side of the bag allows the penis to be freed in order to pass water. The cotton removed from the bag and soiled with pus should be burned and the hands thoroughly washed with carbolic soap.

During the acute stage of the inflammation, the patient should have rest in bed; but rarely will he submit to this, because by attending to his daily duties he does not arouse the suspicion of his friends. The patient should avoid all forms of violent exercise, and sexual excitement is extremely contra-indicated. This disease demands at least nine hours' sleep each night in order to combat the systemic effects. If the urethra should be inflamed so greatly as to stop the passage of water, the whole organ should be placed in water as hot as the patient can bear, and this will reduce the swelling, thus allowing the urine to pass into the basin of warm water. In order to stimulate the flow and reduce the acidity of the urine, the following is recommended:

℞ Urotropine .....one teaspoonful
Benzoate of Soda .....one teaspoonful
Mix, and make into twelve powders.
Dose: Dissolve one powder in half a glass of water three times a day.

It is especially important that the bowels be kept open during this disease, and a laxative dose of some salts should be taken each morning. One of the best salts for this condition is as follows:

℞ Phosphate of Soda .....four ounces
Dose: Two tablespoonfuls in half a glass of water before breakfast.

If the patient shows a general weakness, the diet should be increased and a tonic taken; if the response to the treatment does not become evident, the patient should go to bed for three or four days, which will mean the saving of one month's time later on.

In regard to the internal treatment of this disease, there are no drugs which can be taken by mouth which will be able to kill the germs. The basis of internal treatment is to build up the general system by means of tonics. All the drugs advertised to be given in this disease should be taken very cautiously. For example, sandalwood oil is a drug used for centuries in this infection, and it is known to stop the appetite and cause diarrhea, thus impeding the cure. As long as the disease remains localized to the urethra, we cannot expect to cure it except by using the drugs directly on the urethra itself. Together with the local applications, certain urinary antiseptics should be mentioned, because they keep the urine clear.

The following urinary antiseptics are advised:

℞ Salol .....five-grain capsules
Dose: One capsule three times a day.

℞ Methylene Blue .....one-grain capsules
Dose: One capsule after each meal. It is necessary to protect the clothing when taking this prescription.

Diet.—The diet should be very nourishing but simple in character. Milk should form the basis of each meal; meats should be eaten sparingly; raw fruits may be taken, as lemons and oranges. The patient is to avoid all sour dishes, as lettuce and vegetables with vinegar, pickles, and the like. Sweets are to be taken very sparingly; no pastries or candy should be eaten. Fluids should be taken very copiously; at least four quarts of liquids should be taken each day. No form of alcohol should be touched; this is very hard to impress on the general public, because there are no immediate effects seen, but it lengthens out the duration of the disease. In this disease, the urine becomes very acid and by following the above form of diet, the acidity is reduced and the painful passage of water is stopped.

Local Treatment.—As mentioned above, the cure of this disease can only be accomplished by applying the drugs to the

parts affected. This form of treatment has given the best results because the infection does not invade the whole system. The best and most efficient method of applying these drugs to the urethra is by means of a urethral syringe. This is a simple piston syringe and can be used by the patient himself. It can be made of either glass or rubber with a conical point and a well fitting piston. The size usually used has a capacity of half an ounce. In using the syringe on himself, the patient should first immerse the point in the solution and draw up the piston. Push the piston a little to make sure there is no air in it. The penis should be held in the left hand, with the thumb and index finger near the orifice so that the fluid can be kept in after being injected. The conical point of the syringe is firmly placed in the orifice so that the fluid does not come out along the side of the syringe. The fluid is injected slowly and retained for five minutes. About three similar injections should be taken at each sitting.

The patient should urinate just before injecting, to prevent the discharge being washed backward by the injection, and at the same time wash the pus from the urethra and give the drug a clear space to act on. The solutions usually advised are astringent in nature, but great care should be observed not to shrink the mucous membrane too much, as abscesses may form and cause considerable trouble. In the beginning of the disease only mild antiseptics should be used, but they are to be employed more often than is necessary in the later stage of the disease. There are innumerable injections advised for local use, but only a few are mentioned here, which have proved their value.

Potassium permanganate in watery solution, one grain to the ounce, will be found valuable, or dilute peroxide of hydrogen can be used. It is advisable to have these solutions made up in large quantities and kept in wide-mouthed dark bottles. Years ago nitrate-of-silver solution was used extensively, but of late a silver solution has been found which is especially strong in penetrating power. It is not very painful to inject, and materially shortens the length of discharge. The drug mentioned is protargol, in one-per-cent. solution.

In the later stages of this disease, when the discharge has become watery, a purely astringent lotion is to be used. The

formula which has acquired a wide reputation among the laity is as follows:

℞ Sulphate of Zinc .....fifteen grains
Acetate of Lead .....thirty grains
Tincture of Aconite .....one-half ounce
Boiled water .....six ounces
Mix.
Directions: Use as injection, night and morning.

Abortive Injection.—Occasionally, at the very onset of the disease, people are advised to use very strong injections in attempting to stop the spread of infection. In the vast majority of cases they are a failure because of the irritation they cause by being too strong. The patient has to suffer intense pain, and imagines that by suffering he will be cured.

Posterior Urethritis, or Inflammation of the Urethra near the Bladder.—Many young people consider this a complication of an ordinary attack of gonorrhea. It occurs in so many cases that it ought to be considered a symptom in itself. About the third week the patient will have a sense of fullness or pressure in front of the rectum, and this will necessitate the frequent passage of urine. Blood may come at the end of urination, and considerable pain will be felt when urine is passed. When this symptom is present the patient is not able to control his bladder; as soon as the desire to pass water is felt, the flow begins, and this dribbling of urine keeps the clothing wet. This inflammation is situated near the seminal vesicles, and a very prominent sign of this is painful emissions at night. It is not to be thought that these signs occur in every case when the disease attacks the posterior part, because many cases are found afterward in which no signs were present at all.

To ascertain definitely whether the posterior urethra has become involved, perhaps the best method is the two-glass test. In this test, the first portion of the urine is passed into a clear glass and the second portion into another clear glass. If the first portion of urine is cloudy, it means pus in the anterior portion of the urethra. When the second portion is cloudy, it means that the posterior urethra is involved also. This test is very satisfactory if the patient does not suffer from bladder or kidney trouble.

When posterior urethritis develops, the irrigations should be allowed to go back into the bladder. The severe pain and frequent desire to pass water, which is distressing, can be controlled by using injections of silver nitrate in one-tenth of one per cent. solutions. Occasionally the silver nitrate solution is not effective, and the next best injection is one-per-cent. protargol.

Complications usually arise in the organs which surround the urethra and they are much more important and serious in their results than the original inflammation in the urethra. Some of the most common complications will be mentioned, which are more likely to be noticed by the patient, as follows:

Balanitis is an inflammation of the head of the penis. This is most commonly seen when the discharge is profuse. In order to control this condition when it arises, the parts should be kept clean with Castile soap and the penis soaked in an antiseptic solution night and morning.

Phimosis is a condition in which the foreskin cannot be drawn back over the head of the penis. This should be treated by cleansing with Castile soap and hot water. If the condition does not subside, an antiseptic solution can be injected under the foreskin by means of a syringe having a long point.

Epididymitis.—The epididymis is located on the side of the testicle, and it becomes inflamed in about twenty per cent. of all cases of gonorrhea. This complication sets in by pain and swelling of the testicle; together with this, the patient may have a chill and a rise in temperature. This stage of swelling lasts for a few days and gradually subsides, and there remains in the epididymis a nodule which in later years may break open. The serious part of this complication arises from the fact that if both sides become involved the victim becomes sterile. When this complication arises, the patient should rest in bed; if this is not done, the scrotum should be supported in a suspensory. To relieve the inflammation, hot applications should be applied three times a day. A flaxseed poultice or an application of tincture of iodine will be found valuable. If hot poultices are to be used, the addition of tobacco leaves to them will be found beneficial.

Folliculitis.—This condition, which arises in severe cases of gonorrhea, is noticed by small round, painful nodules occurring in the urethra. These swellings are due to the glands of the

urethra becoming involved. As soon as this complication arises, hot applications in the form of poultices should be used. The application of blue ointment will also be found beneficial.

Prostatitis, or inflammation of the prostate gland. This gland surrounds the posterior part of the urethra, and becomes involved when the posterior urethra becomes inflamed. The diagnosis of this complication is rather difficult if left to the patient. The indications are pain and pressure in front of the rectum, frequency of urination, and pain on evacuation of the bowels. The feces in many cases come out in the form of narrow tape. With this condition there is a certain amount of fever, and if the gland becomes inflamed very quickly there may be a high fever with chills. In this latter case there is abscess formation, and surgical treatment should be resorted to, because the abscess may burst upward and give serious results. This is treated by hot injections into the rectum, poultices to the space in front of the rectum, and hot baths taken three times a day.

Vesiculitis is the result of the gonorrhea spreading to the seminal vesicles. In many cases this condition is not noticed, so that it occurs more often than is supposed. The case should be looked at from a serious standpoint when this condition arises. It is diagnosed by pain at the neck of the bladder; frequent emissions occur, and there is more or less constant erection of the penis. It is treated locally by hot poultices, and it is advisable to have the condition treated surgically.

Cystitis, or inflammation of the bladder, rarely is generalized. The condition when it spreads from the urethra is usually localized to the neck of the bladder. Occasionally the inflammatory process spreads between the layers of the bladder, disabling the patient permanently. In order to treat this condition, both internal and external treatment should be instituted at once.

Internal treatment:

℞ Urotropine .....five-grain tablets

Dose: One tablet three times a day dissolved in water.

Local treatment:

℞ Solution of Potassium Permanganate, two grains to a pint of boiled water.

Directions: Irrigate the bladder with half a pint of the solution every night and morning.

Pyelitis.—This is a rare complication of gonorrhea, but occasionally is found and so must be mentioned. This occurs when the inflammation spreads up the urethra to the kidneys. It means the loss of the kidney, and only temporary relief can be given in this condition.

℞ Acetate of Potash .....two teaspoonfuls
Citrate of Potash .....four teaspoonfuls
Peppermint-water .....three ounces
Mix.
Dose: One teaspoonful in half a glass of water, every three hours.

CHRONIC GONORRHEA

If the discharge from gonorrhea does not stop after two months, it means that the canal of the urethra has become diseased. It also means that there is a stricture of the urethra, or else some small gland has failed to heal. The deeper structures of the urinary canal must have become involved, and when these deep parts heal they do so in irregular fashion, forming little cavities in the urethra. No matter how mild these strictures are, they can keep the discharge flowing. In many cases there will be no strictures, but the discharge is kept flowing by any neighboring gland being involved. The discharge may be very profuse, or else it may be so slight as to be unnoticed by the patient, appearing only in the form of a single drop in the morning; or it may appear only in the form of threads in the urine, which are seen floating on a specimen. The more compact these fibers appear, the more pus they contain, and they are then seen on the bottom of the glass. The patient can almost make the diagnosis on himself, but to locate the lesion the threads must be examined. If they are short and thread-like, they are supposed to be formed in a gland duct; if long and thick, they come from the urethra itself; and if short and lumpy, they come from the prostatic urethra. In many cases their form is changed by the flow of urine, so that the external appearance in the glass may be deceptive. The real localization of the thread can only be made by the microscope.

It is important to locate and determine the cause of the discharge. As mentioned before, the most frequent cause is a urethral stricture, and this can only be determined by examination with urethral sounds.

Treatment of chronic gonorrhea is based on the removal of all obstacles which stand in the way of a cure. If a pathological narrowing has been found, it should be treated by means of dilatation and incision. Injections as recommended for acute gonorrhea may be used here also, but they need only be used once a day, and their strength may be doubled; a two-per-cent. solution of protargol will be found beneficial.

If the condition does not respond to the above treatment, the entire urethra will have to be treated. This is best done by means of irrigation, in which the bladder is filled with fluid through a catheter which is then removed and the patient allowed to eject the fluid, as if he were passing urine. The best solution to inject into the bladder is one-per-cent. nitrate of silver.

The vaccine treatment used by physicians has been found valuable in cases of chronic gonorrhea or in acute cases where the joints are involved. These vaccines are prepared like all other preparations of this name. They are injected into the muscle of the arm. Each day the dose is gradually increased, and some wonderful results are seen at the end of one week.

Throughout the treatment of gonorrhea injections are advised, and because of the sensitiveness of these parts it is best for the patient to have the use of syringes demonstrated to him before their use is attempted.

Diet.—Clear meat broths, oyster soup, all kinds of fish (not fried); lamb, mutton, chicken (not fried); lettuce, asparagus, celery, potatoes, cabbage, string beans; all kinds of cereals; milk, lemonade. No tea, coffee, or alcoholic liquors should be used, nor highly spiced foods.

GONORRHEAL RHEUMATISM

Definition.—Gonorrheal rheumatism, or gonorrheal arthritis, is an inflammation of the joints, as a complication of gonorrhea. It is more frequent in men than in women.

Causes.—It is primarily caused by the germ of gonorrhea and by its poisons. It generally attacks the larger joints such as the knee and hip, but may invade any joint or tendon sheath.

Symptoms.—Pain in the joint, slight chill, muscular soreness, and mild fever. Swelling of the joint caused by effusion of water, fibrine, or pus, or a combination of any or all three. The knee is most frequently attacked. The joint is enlarged and tender, the skin red and tense. Pain may be sharp and pulsating, or dull and continuous, and worse at night. Motion of the joint is interfered with.

Ordinary cases last from five to eight weeks, but may persist for months. In severe cases the joint surfaces become bared, resulting in permanent stiffness.

Treatment.—If gonorrhea still exists, it must be removed. This is accomplished by deep injections into the urethra of a one half of one per cent. solution of nitrate of silver.

Local Treatment.—Rest in bed. Cloths wet with a solution of lead applied to the joint. Internally, the following is beneficial:

℞ Syrup of Iodide of Iron.....two ounces
Dose: Fifteen drops in water, three times a day.

Or:

℞ Potassium Iodide .....two drams
Potassium Acetate .....two drams
Tincture of Nux Vomica .....two fluid drams
Tincture of Guaiac .....four fluid drams
Mucilage of Acacia .....one ounce
Cinnamon-water, enough to make.four ounces

Mix.
Dose: One teaspoonful, from three to five times a day.

GLEET

A very troublesome result of gonorrhea is gleet, and when neglected it assumes the chronic form after all active symptoms have disappeared. In some cases of gleet, no discharge is noticed during the day, but in the morning the lips of the orifice are stuck together and when opened a slight discharge takes place, which leaves a yellowish stain on the linen. In other

cases, the only trace of gleet is an occasional discharge of small mucous threads.

The following injection will be found very beneficial:

℞ Sulphate of Zinc .....fifteen grains
Acetate of Lead .....thirty grains
Tincture of Aconite .....one-half ounce
Boiled water .....six ounces

Mix.

Directions: Use as an injection, night and morning.

STRICTURE OF THE URETHRA

Definition.—This is a narrowing or twisting of the urethra, leading to more or less complete difficulty in passing urine.

Causes.—One of the several causes of stricture of the urethra at one point is the late manifestation of a gonorrheal attack. A chancre located inside the urethra will produce the same result. Stricture can also be produced by accident, or by falling on the perineum, on a spiked fence or other object.

Symptoms.—The condition generally comes on gradually, the person complaining of increasing difficulty in getting the bladder emptied. The stream often becomes forked or twisted, and frequently, after the bladder seems to have been emptied, some more trickles away, wetting the patient's clothes. Matters are often brought to a head by the individual getting cold or wet, indulging too freely in alcohol, or having the fork irritated by a long ride on horseback or on a bicycle. Any of these things may set up a condition of spasm in the already partially obstructed channel, and cause complete stoppage. The bladder becomes greatly distended, causing great discomfort. Stricture is most commonly the result of an old attack of gonorrhea.

Treatment.—The element of spasm in a stricture can be relieved by putting the patient in a hot bath, and, if necessary, unloading the bowel by a large warm-water enema. This is all the home treatment which should be attempted, and it is generally sufficient to give the patient temporary or partial relief. Further measures may consist in dilatation of the stricture by instruments, or cutting of the stricture, or simply the passage of catheters to draw off the water. All depends upon the nature of the stricture, its situation, the occupation and age of the pa-

tient, etc., and what is best can only be decided after examination by the doctor.

In the early stages, the following prescription will be found valuable for relief:

℞ Sweet Spirits of Niter .....one ounce
Dose: One teaspoonful in a wineglass of cold water, every two hours.

SYPHILIS

Definition.—Syphilis is a contagious and inoculable disease of slow development, which, at its commencement, shows a peculiar sore at the site of infection, later brings on constitutional effects resembling those of other infectious diseases, and at a still later period produces certain changes resembling some of those caused by leprosy and tuberculosis. Owing to the circumstances which in the majority of cases attend the spread of syphilis from one person to another, it is generally classed as one of the three *venereal* diseases. This disease affects only human beings, though it has been experimentally grafted upon the skin of apes.

The disease seems to have first attracted public attention about or soon after the year 1494 in consequence of a severe and widespread outbreak among the French soldiers then occupied in the siege of Naples.

Causes.—Various bacteria have been obtained from the sores; but, owing to the regularity with which the *Spirochæta pallida*, a long, thread-like, wavy organism, is found in the earlier sores and their discharges, and the possibility of causing symptoms in animals by inoculation of this organism, it is now proved to be the direct cause.

Syphilis may be *acquired* from persons already suffering from the disease, or it may be *inherited* from one or both parents. The acquired form is usually got by contact with a sore upon another person through some wound or abrasion. The epithelium covering the general surface of the skin seems to be an efficient protection, but the infective material probably has the power of penetrating mucous membranes. Not only may the disease be spread as a venereal affection, but cups, spoons, towels, sponges, sheets, which have been used by the diseased, have been

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SYPHILITIC ERUPTION

known to convey the contagion to others, although fortunately such inanimate articles appear to retain their infectiveness only for a short time. The acquired form of the disease is infectious from contact with sores, both in its primary and secondary stages; while infants suffering from the inherited form are also highly infectious to all other persons save their own mother, who appears, even if she has not shown symptoms of the disease, to attain immunity from infection by her own child, a principle known as Colles's Law. Accordingly any one acting as wet-nurse to, or even frequently handling, such an infant, runs great risk of infection.

Symptoms.—The first sign of this disease is the primary sore or chancre, which is generally seen about the base of the fore-skin. About the third week there is felt some hardening where the sore is going to appear. The typical primary lesion is a small, hard lump feeling almost like a piece of gristle, with a flattened top. The glands in the groin soon become swollen and hard, feeling like small lumps under the skin.

Second Stage.—Next, the patient begins to suffer from sore throat, with the appearance of raised, moist, whitish patches. These sores may appear on tonsils, tongue, or lips. The hair often becomes thin and tends to fall out, and there is commonly pain in one or both eyes and an area of redness around the pupil.

The Rash.—About the tenth week a definite skin eruption appears besides the early rose rash. The character of this rash varies in different cases, and often shows variations on different parts of the same individual. Usually the rash has a coppery hue and affects both sides of the body alike. It is most prominent on the inside of the thighs, the front of the arms and legs, and on the forehead. An important point in the diagnosis of a syphilitic rash is the appearance of a scaling on the palms of the hands and soles of the feet. In many cases where the scalp is not kept clean, a number of small abscesses will form at the roots of the hair. The hair also falls out from the eyebrows, in a number of cases.

Third Stage.—The time of appearance of tertiary symptoms varies from one to twenty years. They are more deep seated and more dangerous to life and health from the destruction of tissue which they cause. The chief tertiary manifestation is the development of a hard, painless swelling known as a gumma.

These gummata frequently involve the bones of the body. When the small bones of the nose are affected a marked disfigurement is caused.

If the disease affects the bones of the skull, it gives excruciating headache, and in rare cases perforates the cranium. In many cases the disease affects the heart and arteries, and in this form it rapidly proves fatal. The gummy tumors mentioned previously may develop in any part of the body, and it is common to find several present at one time. They may be visible in or under the skin, or, if very deep seated, they give rise to pressure symptoms, because they displace the other organs. Often these gummata break up into small sores, which heal slowly and result in bodily deformity. A patient with tertiary symptoms may be expected to show deep skin rashes, lumps on bones, difficult breathing, ulceration in the throat, swelling of the testicles, and paralysis—a very late stage, resulting from involvement of the spinal cord.

Hereditary Syphilis.—It is common for mothers who have syphilis to have frequent miscarriages, or else the child may go to the full term and be born dead. Finally a live child may be born, but it soon develops the signs of hereditary syphilis.

The child may appear healthy at birth, although it is often puny and ill developed, but definite symptoms are bound to appear before the child is three months old. It becomes thin and emaciated, the skin turns a gray color and hangs in wrinkles, while the face is pinched and sallow. The child will always appear to have a cold, and this continuous discharge from the nose is called snuffles. This is always present, and may be so marked as to make breathing very difficult when the child is at the breast.

In congenital syphilis the bones of the nose are affected, and a prominent symptom is a falling in at the bridge of the nose, giving a marked depression between the eyes. The milk teeth appear early and soon crumble away. Fissures or cracks will be seen to form at the angles of the mouth and about the anus. The permanent teeth may be healthy but are frequently deformed by notches and cracks. The vision of the eye is frequently interfered with by the clear portion of the eye becoming clouded. It is necessary that treatment be instituted early so that the child does not become too weak, in which case it will not respond to treatment.

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HEREDITARY SYPHILIS

Treatment.—It is advisable that the chancre be treated as early as possible with mercury washes and salves, and in a few cases this puts an end to the whole malady; if the glands in the groin enlarge and ulcerate, treatment is very difficult. This is the basis of all preventive measures now advised against the spread of syphilis. In the army, soldiers after returning to camp are asked whether they wish to use the precautionary washes to guard against syphilis. Sometimes in spite of all precautions (but it is most commonly from neglect of them) a chancre will follow impure connection. If there is any suspicion, the genitals should be examined each day for signs; if the smallest red dot appears, the patient should apply a caustic pencil, eat nourishing food, and abstain from alcohol.

Rest should be taken and care observed that the affected part is not irritated by rubbing. If a little pocket of pus develops, it should be opened and the caustic pencil applied to the inside of the wound. This must be done thoroughly, and the caustic should be twisted into all parts. Usually after this treatment a scab forms and when this is removed a healthy surface is seen, and not the bleeding, raw surface which occurs when the sore is not treated. Since it is impossible to distinguish the harmless from the syphilitic sores, it is advisable that all little ulcers be treated the same. This can do no harm, yet it can prevent a great deal. All during the treatment the part should be kept covered with gauze to prevent the development of pus germs. If the chancre should be neglected in the beginning and ulcerate, it should be treated the same way as above. The longer the chancre is allowed to ulcerate, the more severe will be the development of the secondary symptoms.

Constitutional Treatment.—This is based on the administration of mercury in one of the many forms which are available. In some rare cases the attack is so severe that the body will not retain the drug, and this is due to some peculiarity on the part of the patient. It will be necessary to vary the treatment, principally on account of the different characters of the chancre. The general health of the patient must be considered, and if the digestive organs are deranged it is necessary to get them regulated before an improvement can be expected.

It is a common mistake to consider the case cured, after a few weeks of treatment, when all the symptoms have disap-

peared. It is necessary to take the mercury treatment for three years at regular intervals, but not steadily. The teeth should be kept in good condition and thoroughly cleansed each day.

Mercury may be given in a variety of ways, either as pills, powders or solutions, or by absorption through the skin from an ointment. By whatever means it is given, the treatment must be kept up intermittently.

The following are recommended:

℞ Calomel .....twenty grains
Lard .....one ounce
Mix.
DIRECTIONS: Apply over the chancre.

℞ Proto-iodide of Mercury .one-quarter grain tablets
DOSE: One tablet three times a day, after meals.

Or:

℞ Bichloride of Mercury ..... two grains
Iodide of Potash ..... three teaspoonfuls
Syrup of Sarsaparilla ..... four ounces
Mix.
DOSE: One teaspoonful three times a day, after meals.

Or:

℞ Pills of Mixed Treatment.
DOSE: One pill, half an hour after each meal.

Or:

℞ Blue Ointment .....two ounces
DIRECTIONS: Apply about half a teaspoonful to the body each night. Alternate, each night, the part of the body to which the ointment is applied.

For the third stage, iodides give the best results and should be given with mercury, as recommended in the previous prescription.

Other drugs are also used, such as iron, arsenic, and the iodides. The modern treatment of syphilis is based on arsenic, namely, the administration of neosalvarsan, or "914." This is given by injections into the veins, and gives quick and efficient results. This drug will not cure with one dose, but it has enormous power in destroying the germs of syphilis.

For inherited syphilis, the child is given mercury in the form of an ointment. The skin under the binder is massaged with blue

ointment. The mother immediately undergoes treatment, and the child, if fed by the breast, will show improvement because the milk will contain the drug. The child should not be given a wet-nurse because she will be sure to get the disease.

BUBO

Definition.—A swelling of the glands of the groin, usually following gonorrhea, chancroid, or chancre.

Causes.—The glands, acting as a protector, gather and confine the germs of syphilis, chancre, or chancroid, in an effort to prevent general infection of the system. The accumulation of the poisonous material causes irritation, followed by inflammation and the formation of an abscess. If allowed to continue its course, the result is a general poisoning of the system, or else the abscess breaks and evacuates; but this does not always occur before general infection has set in.

Symptoms.—The swelling begins to form from three to five days after the appearance of the sore in chancre or chancroid; or from three to ten days after the beginning of the gonorrheal discharge. In either case, a hard lump forms in the groin. This, in the course of a few days, becomes soft and of a bluish color. The onset of the swelling may be accompanied by chills, followed by fever. Pain is present from the beginning. The skin over the swelling eats away in from one to four weeks, and the abscess breaks or discharges of itself. If no poison has been carried into the system, the pain and fever subside. Healing takes place in from one to three weeks, but some cases last many months before the abscess cavity is finally healed.

Treatment.—Rest is important. Violent exercise and long walks or riding are forbidden. Irritating applications of caustics to the chancre, chancroid, or urethra should be avoided. During the first three days applications of cold by means of an ice-bag will prove serviceable, together with compresses wet with a solution of sugar of lead; then hot applications.

Applications of tincture of iodine may cause excessive inflammation of the skin, but the use of vasogen or iodex rubbed in locally is beneficial.

In case the abscess does not break and seems to continue enlarging, it is advisable to have the abscess opened by a surgeon.

The after treatment consists of bichloride of mercury gauze dipped in hot water and applied every three hours; or a mixture of balsam of Peru one part, castor-oil ten parts, applied to the wound.

In addition, the patient should have plenty of nourishing food and tonics, such as elixir of quinine, iron, and strychnine, a teaspoonful three times a day; cod-liver oil or Russell's emulsion.

Note.—Care should be taken not to transfer any of the discharge from the bubo to the eyes or other parts of the body, as it gives rise to a new point of infection.

THE WASSERMANN TEST FOR SYPHILIS

Wassermann reaction is a test introduced in recent years for the diagnosis of syphilis by examination of the blood. With the exception of leprosy, yaws, and some of the acute infectious diseases, the only condition in which the blood appears to give this reaction is syphilis; and, as the diseases mentioned are not likely to cause confusion, the test forms a valuable diagnostic for the latter condition in at least ninety per cent. of cases.

The reaction depends upon the principle known as "fixation of complement," and is only capable of being satisfactorily performed in a laboratory. In every blood there exists a substance known as "complement." If a poison capable of destroying blood-corpuscles be introduced into the blood, some of this complement must be absorbed or fixed by the poison before the corpuscles can be broken up. In the Wassermann reaction some of the suspectedly syphilitic blood serum is mixed in a tube with an animal extract and with a definite quantity of complement, and then a test is made to find whether the complement has been fixed to the extract or not. If it has been fixed, then the suspected serum must have contained a substance capable of joining it to the extract, and the person from whom the serum was taken has syphilis. If the complement is unfixed and still free to act, then the person's blood may be pronounced healthy.

Method of Use.—Blood is drawn from the suspected person by puncturing a vein in the arm or elsewhere with the needle of a large hypodermic syringe, filling the syringe and squeezing

the blood into a sterile test-tube which is sent to the laboratory. The reaction is done in two stages:

Stage 1. To give the syphilitic material, if present, a chance to "fix complement." In a small test-tube there are mixed (*a*) a small quantity of the serum separated from the clot of the suspected blood, which has already been heated for half an hour at 55° C., in order to destroy the natural complement which it contains, and diluted with normal salt solution; (*b*) a little alcoholic extract of some animal tissue, such as liver; (*c*) the same quantity of a healthy serum, as that of a guinea-pig, which supplies the necessary complement. This tube is placed in an incubator for an hour and a half to allow "fixation of complement" to occur, if it can take place.

Stage 2. To find whether "fixation of complement" has taken place or not. To the tube are now added (*d*) one cubic centimeter of fluid containing one part of sheep (or ox) blood-corpuscles, carefully washed free from serum, in twenty parts of normal salt solution; and (*e*) a sufficient amount of a special serum derived from an animal such as a rabbit, which has previously had sheep (or ox) corpuscles injected into its blood and has in consequence developed an "anti-body" capable of breaking up these foreign corpuscles. The tube is returned to the incubator for another hour.

If then the blood-corpuscles have settled uninjured to the bottom of the tube, the complement must all have been fixed in the first stage, so that the anti-body could not act in the second stage; and syphilis is therefore present. The reaction is said to be positive.

If the corpuscles are broken up, as shown by a diffuse red color through the tube, then complement was left free to act in the second stage and no syphilitic substance was present to fix it in the first stage. The reaction is said to be negative.

CHANCROID

Definition.—This is a contagious venereal disease, appearing as an ulcer on the genitals.

Cause.—It is caused by a definite germ, and it spreads by contact.

This disease appears as a sore on the penis, and for a long

time was confused with the sore of syphilis. The two conditions may be present in one person, but there must be two definite germs. This disease causes inflammation of the penis, with enlargement of the surrounding lymph glands, but the poison of chancroid never enters the blood and spreads as does syphilis; it remains localized to the genital region.

All sores which appear on the penis should be given careful consideration, because the soft chancroid cannot be distinguished from the hard chancre of syphilis. In many cases married men have been found who developed syphilis later in life because they neglected a soft chancroid. The germ of this disease is easily killed by heat and antiseptics.

It is claimed by many that chancroids are very numerous among the poorer classes in general, a class whose vitality is lowered by lack of proper food, excess of alcohol, and unhygienic surroundings. It is this class of people who are most susceptible to all infections. In these people the secretions of the genitals are allowed to collect, and this furnishes an excellent medium for the development of germs. This disease is not confined to the debilitated, but is also found in the robust and healthy.

The period of incubation, that is, the time before the ulcer appears, is usually two or three days, although nothing definite can be stated.

Symptoms.—The first sign is a red pimple surrounded with a red, inflammatory area. This pimple breaks and leaves a gray ulcerated area; this ulcer spreads and the surrounding parts all become red. In many cases more ulcers may develop because the primary ulcer is not kept clean with antiseptics, so that it is not uncommon to see several ulcers at one time. With this spread of infection, the lymph glands enlarge and those located in the groin show up first. They become enlarged and very painful. They may even break through the skin and ulcerate, constituting a bubo. In syphilis, the glands in the surrounding area enlarge, but they do not ulcerate except in rare cases; they are enlarged and painful.

If the sore is located near the opening in the penis, the effect of the urine passing over the raw surface is very painful. Relief may be obtained by urinating with the penis immersed in warm water. The duration of the disease is modified so much

by the patient's general physical condition and habits of life, as well as by the medical management of the case, that it is difficult to give a definite time limit. In all cases a bacteriological test should be performed, and if the diagnosis is at all doubtful, a blood test should be made, to rule out syphilis.

Treatment.—As soon as the disease makes its appearance, the patient should use antiseptics and keep the genital region clean. A good antiseptic is a hot permanganate-of-potash solution, about two grains to a pint of hot water.

The sore or ulcer should be covered with white precipitate ointment and kept clean with gauze covering. If buboes appear, the part should be covered with hot applications, as a hot-water bottle or flaxseed poultice. If the glands break through the skin, they should be cleansed with alcohol and covered with a gauze bandage. The patient should immediately begin to take some tonic to build up his resistance. The following are recommended:

℞ Elixir Iron, Quinine and Strychnine..three ounces
Dose: One teaspoonful in a wineglass of water, three times a day.

℞ Tincture Gentian Compound .....two ounces
Simple Elixir .....one ounce
Mix.
Dose: One teaspoonful in half a glass of water, three times a day, before meals.

THE TESTICLES AND THEIR DISEASES

Anatomy.—The testes or testicles are the two male sexual glands. Each is developed in the corresponding loin, but before birth they descend through openings in the lower part of the front of the abdomen into a fold or pouch of skin known as the scrotum. This fold is strengthened by a layer of muscle fibers and fibrous tissues, and within it each testicle possesses a separate covering known as the tunica vaginalis. This tunic is a double layer of serous membrane similar in structure to the peritoneum or pleura, and it is derived from the peritoneum while the testicle is still within the abdomen. Occasionally, as the result of defective development, a more or less open channel of com-

munication is left between the peritoneum and tunica vaginalis, and down this channel a hernia is liable in childhood to take place. Throughout life, the openings in the abdominal wall remain, but these "inguinal canals" should be just large enough to allow the passage of the two spermatic cords, each of which is composed of the vas deferens or duct of the testicle, together with the blood-vessels, nerves, and lymphatics proceeding to the gland. Within the tunica vaginalis lies a dense fibrous coat known as the tunica albuginea, which affords protection to the gland. On microscopic examination, each testicle is found to consist of a series of minute tubes from eight hundred to one thousand in number, supported by fibrous tissue in which the nerves and blood-vessels run, and lined by cells from which the spermatozoa are formed. These tubes communicate with one another near the center of the testicle, and are connected by a much convoluted tube, the epididymis, with the vas deferens, which, as already stated, enters the abdomen and passes on to the base of the bladder. This duct, after joining a reservoir known as the vesicula seminalis, opens, close to the duct from the other side of the body, into that part of the urethra which is surrounded by the prostate gland. Owing to the extremely convoluted nature of these ducts leading from the testicles to the urethra, and their indirect route, the passage from testicle to urethra is over twenty feet in length, although the actual distance of its two ends apart is only two or three inches.

The pouch of skin in which the testicles lie is liable to various general skin diseases, but particularly to eczema, which is in many cases very irritable and very difficult of cure. Cancer of the skin in this region seems to be specially common among chimney-sweeps, the result, it is supposed, of some irritating substance contained in soot. Sometimes, owing to defective development, the testicles are retained within the abdomen, and in that case these glands are likely to be atrophied and useless as well as painful.

Hydrocele is a local dropsy affecting one tunica vaginalis, and distending that side of the scrotum with fluid often to a great size. It appears most commonly either during infancy or in advanced years, and is said sometimes to be connected with gout or to follow upon injuries. The swelling is tense, elastic, and sometimes difficult to distinguish from a hernia, though it

differs from a hernia in the facts that it does not increase in size as the person coughs, and that it appears translucent when a bright light is placed behind it. When it becomes tense, the fluid is relieved by tapping, or the condition is cured by injecting some irritating fluid into the cavity, or by opening the tunica and removing a portion of it altogether, so that the cavity between its layers closes up entirely.

Varicocele is a condition in which the veins of the spermatic cord, especially on the left side, become unusually numerous and distended, the causes being much the same as those of varicose veins in other parts. The chief symptom is a dragging sensation in the testicle, which in some cases becomes at times very painful. This symptom is specially marked in warm weather and after exertion, the mass of veins at such a time becoming very distinct and resembling a bag of worms, though they empty quickly when the person lies down. Cold sponging of the part, careful regulation of the bowels, and the support of a suspensory net bandage afford all the treatment that is necessary in most cases; though, when the condition is very painful or the person is desirous of entering one of the public services, an operation is advisable with the object of ligaturing and removing the veins.

Inflammation of an acute type (orchitis) may arise in persons suffering from cystitis, stone in the bladder, and various forms of inflammation in the urinary organs, the most common cause of all being gonorrhea. It may follow also upon some cases of mumps. The symptoms are intense pain and swelling with redness of the skin over the affected testicle; and the usual treatment consists of rest in bed, and the application of Burow's solution as a wash; or else lead-water may be used.

Tuberculosis comes on in the testicle occasionally, especially when some other organ, such as the bladder, is already the seat of the disease. It causes practically no pain, and is therefore often far advanced before it attracts attention. In cases where no other organ is affected, the testicle is usually removed in order to prevent the spread of the disease to other parts.

Injuries of the testicles are rare. A severe blow may lead to shock and symptoms of severe collapse for a time, and may cause an effusion of blood into the tunica vaginalis. These symptoms are, however, relieved by rest in bed, for, owing to their mobility, it is rare to find the testicles seriously injured.

CRABS

Definition.—This is a parasitic condition which affects the skin about the external genitals. The insect burrows its way under the skin and causes profuse itching.

Causes.—It is usually due to uncleanliness and coming in contact with uncleanly persons who are affected. Often the parasites can be seen clinging to the hair about the genitals.

Symptoms.—The attention of the patient is attracted to the parts by intense itching. Together with this there may also be present shooting pains from the irritation of the skin. In severe cases the lymph glands in the groin become swollen and painful.

Treatment.—Cleanse the parts carefully with an antiseptic soap, moisten with tincture of larkspur, and use stearate of zinc as a dusting powder to prevent chafing. If this does not prove effective, then the part should be shaved and blue ointment applied day and night.

THE PREVENTION OF VENEREAL DISEASES

This has reference only to acquired syphilis, chancroid, and gonorrhea.

Each of these diseases is caused by its own distinct germ or microbe, and the problem is to prevent that germ from being transferred from an affected person to an unaffected one. A man suffering from so-called "strain," or simple urethritis, or a woman with the "whites," or leucorrhea, is a subject of suspicion and should not attempt intercourse until after a bacterial examination shows freedom from infection.

As to mechanical means, the use of a condom requires the utmost care and is not safe, owing to its liability to tear, or to the difficulty of its removal.

As to applications to be used externally, before cohabitation, the medical departments of the armies and navies of many nations issue to the soldiers and sailors a safety packet containing as its most essential ingredient an ointment composed of:

℞ Calomel ..... ten grains
Lanoline ..... two drams
Cocoa-butter ..... four drams

Directions: Rub together thoroughly.

This is applied by means of a container which is a collapsible metal tube with a nozzle for insertion into the urethra. A small amount is squeezed into the urethra and some is applied to the exterior of the organ also. When properly done it destroys the germs in a short time.

The use of strong injections after intercourse, such as astringents like solution of alum, zinc oxide, corrosive sublimate, etc., is extremely dangerous, as they not only burn off the mucous membrane lining the urethra, but the improper manner of the injection may push the infectious germs along into the bladder, causing cystitis; or in the male, into the tube leading to the testicles, causing enlargement and inflammation of that organ (orchitis); or in the female, into the womb and ovarian tube, causing infectious inflammation of those parts (metritis and salpingitis respectively).

Persons suffering from any of the above diseases, or from suspicious symptoms, should be careful to protect not only others from infection, but themselves also. The purulent discharge from gonorrhea, if conveyed to the eyes, will produce a gonorrheal ophthalmia, or an inflammation of the membranes of the eyeball, as well as of the lids, and may result in perforating ulcers of the cornea, or window of the eye, with partial or total blindness.

A chancre is generally a single sore with a hard base and overhanging edges. Its location is not confined to the genital organs. It appears on the eyelids, lips, nose, palate, and on the fingertips and about the arms. It is always the initial sore of syphilis.

Chancroids—generally more than one sore, the group finally merging into a single large ulcer—are due to infection by their own particular germ, and are local in effect and may or may not be present with the chancre of syphilis. No chances should be taken with them, however, as personal cleanliness is absolutely enjoined in order to confine these diseases to the persons originally affected. All discharges should be collected on absorbent cotton or lint, and burned, or disinfected with the following:

℞ Corrosive Sublimate..... seven and three-tenths grains
Ammonia Chloride..... fifteen grains
Water ..... one pint

Stained clothing should be handled with care and thoroughly boiled or allowed to soak in a chloride-of-lime solution overnight.

Every infected person should be provided with his or her own towel, wash-rag, soap, hand-brush, and germicidal soap, etc.

TOBACCO HABIT

Definition.—Tobacco is the leaf of several species of Nicotiana, especially of the plant *Nicotiana tabacum*. It is not used in medicine except to prepare a soothing lotion, but demands some notice here on account of its popular use and the marked effects it produces.

Composition.—In addition to vegetable fiber, tobacco leaves contain a large quantity of ash, the nature of this depending largely upon the minerals present in the ground where the tobacco plant has been grown, but amounting to twelve or twenty per cent. of the whole. Of the organic constituents the brown fluid alkaloid known as nicotine is far the most important, as the special action of tobacco depends upon it. The milder and better flavored tobaccos of Havana and Manila contain only two to three per cent. of nicotine, while some of the common French and German brands have as much as nine per cent. The nicotine is to a large extent destroyed as the tobacco burns, and necessarily so, since a strong cigar contains more than sufficient nicotine to poison a person, in the pure state. Various ammonia products, an oil, and a resinous substance are also produced as the tobacco burns.

Snuffing is perhaps the method of taking tobacco in which it produces least effect upon the system, having little but a stimulating action, while chewing is from all points of view the most objectionable. The pipe, cigar, and cigarette in this order are methods of smoking by which increasing amounts of nicotine are taken into the system from a given weight of tobacco. As a cigar or cigarette is smoked, the nicotine and other volatile products retreat before the heat, so that the stump or butt becomes very highly charged with them and is the most active part of the cigar.

Action and Uses.—The action of tobacco depends largely upon the constitution of the smoker, his habituation to the drug, and the circumstances under which he smokes.

A very small amount of nicotine, such as that derived from a single cigarette, has a decidedly stimulating effect upon the

mental and bodily powers. Thus a pipe after breakfast is said to impart a feeling of vigor and to exert a laxative effect.

In larger amount, the action is a depressant and narcotic one, which, in habitual smokers, is modified to a sedative and quieting effect upon the nervous system, without much depression of the heart or other organs. The most suitable time for smoking is generally admitted to be after meals, and especially in the evening after the day's work is at an end, when the sedative action is most beneficial to the nervous system. Different people vary widely in their susceptibility to the influence of tobacco; for in some, and particularly in young persons, very small quantities suffice to cause depression and irritability of the nervous system, the heart's action, and the digestive and other powers; while others, especially those who lead an open-air life, are not in the least affected by very large amounts. Generally speaking, excessive smoking is a hurtful thing, particularly for young people, and a liberal allowance of tobacco for a healthy, full-grown man is usually fixed at a maximum of four ounces in the week.

Among the evil effects of smoking may be mentioned the temporary nausea, depression, giddiness, and vomiting which affect the unaccustomed smoker. These effects, however, pass off quickly, and the tendency to their occurrence disappears as the person becomes habituated to tobacco. Of more importance is the group of symptoms produced by continued and excessive smoking, especially of cigarettes. These include palpitation and irregularity of the heart, giddiness, and a tendency to sudden attacks of faintness, symptoms often grouped together under the popular name of "tobacco heart." Other common symptoms are liability to fatigue on slight exertion, dyspepsia, and dimness of vision associated with impairment of power for seeing colors, especially green and red. These symptoms also pass off gradually when smoking is discontinued, or when the amount of tobacco consumed is reduced within suitable bounds; but, while they last, they cause great impairment of the health, and the partial blindness is very liable to continue for long.

Another set of symptoms frequently arising in those who smoke short pipes, and often attributed to a mistaken cause, consists of irritable cough, soreness of the throat, and enlargement of the tonsils, liable to become worse in damp weather. These

symptoms also pass off when smoking is discontinued, or some change is made in the method of smoking.

Acute tobacco poisoning seldom occurs, though it has sometimes been caused by a child having eaten some tobacco. The symptoms resemble those that affect the unaccustomed smoker. The treatment to be adopted resembles that for poisoning by opium and other narcotics, including the administration of an emetic, followed by strong tea, coffee, or other stimulant.

HABIT-FORMING DRUGS

Drugs which have been administered for the relief of pain, for sleeplessness, or as a temporary stimulant, or which have been taken out of curiosity, are sometimes continued for their pleasurable effects or for the temporary sense of increased well-being which they confer, until their use becomes a habit. This habit may be continued either because the habitué has not sufficient will power to resign the pleasure derived from the use of his drug, or, very often, because any attempt to break off the habit leads to severe mental and bodily distress, which may even be dangerous to life. All such habits lead to a mental and moral deterioration, and, under proper precautions, they may in every case be broken off.

Ether Habit.—This is by no means common, but comes into vogue now and then. Several teaspoonfuls are taken with water, and produce quickly a state of excited intoxication, which goes through all the stages of alcoholic intoxication in an hour or thereabout. The treatment is similar to that for alcoholism.

Cocaine Habit.—This drug is generally taken hypodermically by its habitués, or the leaves may be chewed. A hypodermic dose of one grain or thereabout may produce after a few minutes a feeling of suffocation, anxiety, and faintness, but this rapidly passes off, and is followed by mental exhilaration, rapidity of thought, and a feeling of buoyancy. After a short time however, this passes off, and as dose after dose is taken, a reaction of deeper and deeper depression ensues upon each. The drug begins to lose its effect, and larger and larger doses have to be taken; while, at the same time, dyspepsia, loss of appetite, restlessness, sleeplessness, forgetfulness, and failure of the power to apply the mind to any task appear. Finally, the per-

son may pass into a state of melancholy or mania. The treatment is similar to that for the morphia habit, but the cocaine habit is perhaps the harder to renounce.

Morphia Habit, or opium habit, is perhaps the commonest one indulged in. Although the ordinary dose of morphia is about a quarter of a grain, and of laudanum about thirty drops, habitués of the drug become so inured to it that a hundred grains of the former are said to be sometimes taken daily, and the latter has been drunk as if it were wine. It must be borne in mind, however, that by some Oriental peoples opium is widely used, not in an excessive and pernicious manner, but in the same sense as tobacco is used. The confirmed morphia-eater, who takes excessive doses or uses the drug constantly, speedily degenerates. His face becomes sallow, his appearance prematurely aged, and his muscles wasted. The memory becomes bad, sleep is lost, and conditions resembling neuralgia or ague come on, from which the only relief is given by larger doses. The character changes also, and a person who previously was honest and truthful becomes in everything utterly untrustworthy. Delusions of various sorts may present themselves, and under their influence criminal acts may be performed. If the drug be suddenly stopped, there is always much suffering, Restlessness and sleeplessness become extreme, excruciating pains come on, and dyspepsia, diarrhea, and vomiting appear. Within one day a delirious condition may ensue, and even collapse and death have occurred.

Treatment.—The longer the habit has lasted, the less hope is there for permanent abandonment of the drug, and persons who have long lost self-control may relinquish one habit only to fall into another, like that of alcohol. There are three modes of treatment. The first consists in abandoning the drug entirely and at once, and this is the best thing for cases in which only moderate doses are taken. A certain amount of suffering is inevitable, but it is minimized by temporarily replacing the morphia by large doses of bromide of sodium. The second mode is by rapidly withdrawing the drug, beginning with one third of the habitual dose and reducing this to nothing in the course of a week or ten days. These diminishing doses should be given by the mouth, and the syringe abandoned. Bromide of sodium is given in doses which increase as the morphia is diminished.

This is perhaps the best method in most cases where large doses are taken, and should be combined with a milk diet, rhubarb and soda if there be indigestion, caffeine or kola if stimulants be needed, and massage or hot fomentations for the pains, if these be severe. The third method consists of slow reduction, lasting over weeks or months, and is sometimes necessary in the case of very weak people, who might collapse on a sudden removal of their drug. Tonics, change of scene, and, above all, careful watching of the patient are necessary for a long time after the habit is shaken off. Give the following:

℞ Bromide of Sodium .....four teaspoonfuls
Bromide of Ammonium .....four teaspoonfuls
Chloroform-water .....three ounces
Mix.
Dose: One teaspoonful in a small amount of water, every three hours. This can be repeated at night if sleep is broken.

Chloral Hydrate, Sulphonal, Trional, Bromides, and **Paraldehyde** have also their devotees, the habit having been contracted through taking the drug for insomnia. Confusion of mind, digestive troubles, and inability to transact business are the symptoms, but these habits are out of comparison more easily abandoned than those of cocaine or morphia. The drug should simply be stopped once and for all, the patient resting quietly in bed for some time and being massaged or placed in a wet-pack to induce sleep. Give the following:

℞ Caffeine Citrate .....one-grain capsules
Dose: One capsule every three hours.

Arsenic Habit is a pernicious but uncommon one, and is treated by gradual diminution of the drug.

ALCOHOLISM

Acute Alcoholism.—This is the condition produced by taking excessive quantities of alcohol over a short period. The effects vary greatly according to the hereditary and nervous constitution of the person concerned, his or her age and social surround-

ings, and to a great extent with the kind of liquor taken, whether it is taken with food, and whether it has been taken for a long time previously.

Varieties.—There are many curious effects produced and phases of character brought to light by the disturbance of mental balance, but the three important forms are ordinary drunkenness, "mania a potu," and "delirium tremens."

Symptoms.—*Ordinary drunkenness* is too common to need much description. First the person is brightened, his spirits rise, his conversation is witty, and the blood runs joyously through his veins. As he becomes really drunk a phase of depression-excitement comes on; one person becomes angry, resents fancied affronts, and tries to pick quarrels, another becomes melancholy, a third grows maudlin, and weepingly recounts the secrets of his family to perfect strangers, while a fourth type assumes a regal manner and gives away his money and valuables or makes promises which he cannot possibly fulfil, and all lose the controlling power of reason. A third stage is that in which all feeling of shame is lost, and there is dullness of sense and loss of power, the drunken man or woman reeling or falling and rising with difficulty. The fourth stage is popularly known as "dead drunk"; the person lies in a state of insensibility, with stertorous breathing and dilated pupils.

Mania a potu is the form which often affects neurotic young men or women with a family taint of insanity. A state of excitement, fury, or violence, sometimes with attempts at murder or suicide, comes on after, it may be, only a few glasses of spirits, and lasts some hours or days, without any tendency to dullness or sleep.

Delirium tremens is the most serious form, and is popularly known as "blue-devils," because of the hallucinations accompanying the state. It follows on a long course of drinking which has ended in a bout, or may be brought on by an injury or business worries in a heavy drinker; or even, it is said, by the sudden stoppage of excessive drinking, but it does not follow a single "spree." Tremors all over the body, but especially in the hands and tongue, are the first sign of its onset, then complete loss of appetite, sickness, rise of temperature, weak pulse, and constant purposeless movements. Finally hallucinations come on; spiders, flies, mice, rats are described on the clothes or floor, or dis-

gusting objects like snakes, toads, and demons, or the bystanders are taken for policemen, hangmen, etc., and the furniture distorts itself into weird shapes. Lastly, delirium of a terrified or raging type comes on, in which there is more or less danger of suicide or homicide. Pneumonia of a serious type is apt to ensue, and if these two be combined the case is usually fatal. About ten per cent. of hospital cases die owing to exposure before admission, but in private practice most cases recover.

Treatment.—*Ordinary drunkenness* is best treated by letting the person sleep it off, or, if great quantities of alcohol have been rapidly taken, the stomach should be washed out with the stomach-tube. In the second or excited stage, and in mania a potu, if the person be uncontrollable, he is to be treated as in *delirium tremens*. In the latter, careful nursing and constant watching are necessary. Sometimes, when the heart is very feeble, alcohol may be given, but its use is seldom necessary. Sedatives are necessary. Of these the prolonged tepid bath is safe and effective, the patient being allowed to remain in the water for several hours if necessary. A dose of potassium bromide (thirty grains) may be given, and repeated in an hour if not effectual at first. Sulphonal and trional are also used but are not so effective. If the patient be in a state of raging mania hyoscin will quiet him, but it is so powerful a drug (the dose being less than one hundredth of a grain) that it should not be used except by a medical man. The delirious person should not be held down, but, if very violent, may be fastened by a sheet or by wrists and ankles to the bed, when he soon becomes tired and sleeps.

Chronic Alcoholism.—This is the condition of mind and body produced by taking too much alcohol over long periods. It has been calculated that an ounce and a half of alcohol, representing a wineglassful and a half of spirit, or a pint of light wine, is the utmost that a large-sized, healthy, hard-working man can daily dispose of without damage to health and mental powers; but even this, in cases of debility, bad heredity, etc., may be too much.

Causes.—The alcoholic habit is of two kinds: *vicious*, in which people, often in the lower strata of society, drink because their associates do, because they have no sense of their duties to society and love the stimulating and soddening effect of drink,

though they have no absolute craving therefor, or because they are driven by their misery and worries to find the only relief from their woes in drunkenness; and *diseased*, in which persons, often of fine mental and moral feeling, are driven, sometimes irresistibly, always against their wish, to satisfy a craving for the effects of alcohol, regardless of consequences. Dipsomania is the name given to the latter, and it has been ascribed in different cases to (1) a weak mental heredity with family history of insanity, epilepsy, hemophilia, etc.; (2) the fact that father or mother was under the influence of alcohol at the time of conception; (3) long-continued vicious drinking, causing almost a necessity for alcohol in the system; (4) injuries to the head or sunstroke; (5) the use of alcohol when the system was in a weak state; (6) its use for the first time at one of the critical periods of life, as at puberty or the menopause.

Symptoms.—*Mental symptoms.* One symptom occurs only in the dipsomaniac form of alcoholism, which is that though the person is perfectly aware that his habit is shortening his life, blunting his finer feelings and impulses, and even leading him to ruin and crime, and though he struggles sincerely and vehemently against it, the craving repeatedly overpowers him. This may occur constantly, or the victim may have long intervals with no desire for drink, till at definite periods the craving comes, either with some warning of headache and malaise, or absolutely suddenly, and the dipsomaniac rushes, as if possessed, to the nearest bar or saloon to pour alcohol down his throat. All feeling, all morality for the time being perishes, and no crime is too heinous to stand between the slave and his master. Among chronic drinkers the first symptoms are mental. There may be no drunkenness; in fact, the most vicious alcoholics are those who are constantly having "drams" or "nips" and "cocktails" the whole day and every day, with seldom a real "bout" or "spree." The drinker becomes lazy, dyspeptic, untrustworthy, forgetful. Later he grows tremulous, suspicious, bad-tempered, and develops a special dislike for those who were before nearest and dearest, and, as the case advances still farther, develops fixed delusions that his friends are attempting to rob, poison, or otherwise injure him. Most of the revolting murders of wife and children, followed by suicide, are committed by chronic drinkers who are passing into delirium tremens. Or, if the

mental balance be more stable, the result is a gradual loss of all intellectual power, till the tippler, between forty and fifty, becomes weak, silly, and demented, entering on his dotage soon after fifty.

Bodily symptoms are produced as a result of tissue changes from the irritation of the alcohol. The mental changes noted above are the result of inflammation on the surface of the brain, followed by adhesions to its enveloping membrane, thickening of the arteries with lessened supply of blood to the brain, and consequent fatty degeneration of the nerve cells. The nerves all over the body undergo chronic inflammation, producing paralysis of limbs, blindness, etc. Catarrh of the stomach, causing dyspepsia and vomiting, comes on early. Cirrhosis of the liver, with dropsy, is a very frequent complication.

Treatment.—The first thing to do is to give up alcohol entirely. For the person with a dipsomaniac craving or vital organs damaged by excess there is no question of moderate drinking. The treatment of symptoms such as vomiting, dyspepsia, paralysis, is given under these heads. All sorts of drink-cures are advertised and sold; some contain drugs, such as bromides and caffeine, which tide the drinker over the depression caused by an attempt to shake off his habit; others, such as hypnotism, Christian science, religious revivals, active crusades against drunkenness in others, rouse up in unstable persons dormant powers of resistance; but, though a few veritable cures take place when the habit is once broken, in general, relapses occur, and if drugs be injudiciously given more pernicious drug-habits may be learned in addition. The idea that some drug may be given without the drunkard's knowledge, to cure him, is unlikely.

As a substitute for alcohol, the following may be taken:

℞ Caffeine Citrate .....one-grain capsules
Dose: One capsule every three hours during the day. The capsules are to be stopped each night, two hours before retiring.

Diet.—The food should be light, fluid, and stimulating, such as milk, beef tea, beef juice, and chicken soup; complete rest and this type of food will in a few days ward off a threatened attack.

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ILLUSTRATION No. 1

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ILLUSTRATION No. 16

PHYSICAL CULTURE AND DEEP-BREATHING EXERCISES FOR MEN

INTRODUCTION

THE value of physical culture and deep-breathing exercises is being realized more and more every day by the general public. It has not been so very long ago that these things were scoffed at by the majority of people as being fads practised only by a certain few.

The purpose of these exercises is not to attain a great muscular development, but to have perfect health; and no person can have a strong, sound constitution who has weak organs. A good strong constitution is within the reach of almost every one. If you want it, you can attain it; it is simply up to yourself. Day-laborers, iron-workers, farmers, clerks, mechanics—in fact, no matter what your occupation may be, you need exercise which will bring the internal organs into action. You may have muscles which stand out like whipcords, but that does not signify strength.

A chain is no stronger than its weakest link, and do not forget that your heart, lungs, liver, stomach, intestines, etc., are each a link, and in fact the most vital links in that wonderful machine, the Human Body.

For a man to be physically strong and keep so, he must perform such exercises as will bring every organ, and not alone his muscles, into active play. Above all, do not neglect your deep-breathing exercises.

The following system, if carefully carried out, is the greatest of all preventives of disease. The instructions were written for this work by Professor Liederman, and are being used by him in his courses of instruction to his pupils.

BREATHING EXERCISES

The Various Kinds of Breathing Exercises.—All impediments to the free movements of the chest must be removed. The air which enters the lungs should be as pure as possible, more especially since in deep breaths any impurities that may be inhaled will be drawn deeply into the lungs. In the first place, normal breathing takes place through the nose, the ingoing air being thereby warmed, moistened, and filtered. Seeing what an important part the nose plays in preparing the inspired air, it is imperative that there shall be no nasal obstruction.

Two types of respiration are recognized: the *costal,* produced by movements of the ribs, and the *abdominal,* produced by the action of the diaphragm. The individual must first learn the difference between costal and abdominal breathing, since each has its own peculiar effects.

Abdominal breathing is best learned lying on the back. Concentrate attention on the abdomen, seeking to protrude it to the utmost with every inspiration, and to keep the chest fixed. Now retract the abdomen to its fullest possible extent.

Costal breathing must be practised both in the horizontal and upright postures, the attention being concentrated on the ribs, and these should be raised to the utmost, while at the same time every effort is made to keep the anterior abdominal wall stationary.

Active Breathing Exercises.—(1) Take the fullest possible costal inspiration, followed by an ordinary expiration.

(2) Expire to the utmost, bending the body somewhat forward, and then take an ordinary inspiration, resuming the vertical position.

(3) Take the fullest possible costal inspiration, and then expire to the utmost, bending the body forward.

(4) Stand with the legs well apart, and take a deep abdominal inspiration, followed by a passive expiration, that is, one resulting from recoil merely.

(5) Stand with the legs well apart, and take a deep abdominal inspiration, followed by a deep abdominal expiration.

(6) Sit down. Fold the hands on the lap; bend the body forward as far as possible. Now take the deepest possible ab-

dominal inspiration with closed mouth, and then gradually raise the body, lift the arms over the head, and take the fullest possible costal inspiration. After this, passively expire, by recoil merely, with open mouth, allowing the arms to drop suddenly. Expiration should not proceed beyond the limit of ordinary expiration, and should not occupy more than one second, inspiration occupying not more than six seconds.

Breathing Exercises Combined with Other Exercises.—In this way groups of muscles may be strengthened at the same time that the person derives the special advantages to be had from increased respiratory activity. The individual stands. Inspiration should be taken through the nose, expiration through the open mouth. The former long, the latter short.

(1) The arms, held stiff, are swung round as far as possible in the open manner. Inspiration accompanies the upward movement, expiration the downward movement.

(2) The arms, held stiff, are moved from the side of the body outward to the vertical, and then returned to the original position.

(3) The arms are bent at the elbows and held close to the sides. They are moved upward, and extended to the vertical with inspiration, being returned to the original position with expiration.

(4) The arms hanging down, the hands are moved upward into the armpits as far as they will go, the elbows moving outward. They are then returned to the original position.

(5) The arms, held horizontally in front of the body, are swung backward in the horizontal plane as far as they will go, and then returned to the original position.

(6) While the hands rest upon the hips, with the thumbs behind and the fingers in front, the elbows are moved backward as far as they will go, and then returned to the original position.

(7) The arms, held horizontally forward, are swept downward and backward as far as they will go, the body meanwhile bending forward, the original position being then resumed.

Advantages Derived from Breathing Exercises.—Breathing takes place by means of movements of the ribs and diaphragm—a flat muscle which separates the chest from the abdomen. During inspiration, the ribs are elevated and the diaphragm descends; during expiration, the ribs descend and the diaphragm ascends.

Breathing exercises stimulate the flow of blood through the lungs, and thus facilitate the excretion of waste products, and they do more than this: they tend to keep the chest-wall mobile, a very important consideration in view of the fact that as one gets older the chest tends to become rigid. This is one of the troubles in connection with the "winter cough" of the elderly, for an immobile chest means that the expectoration cannot be got rid of. Not only this, but with a mobile chest "winter cough" is much less liable to occur.

They are also of great use in all *chronic affections of the lungs.* The more perfectly developed the lungs and the more mobile the chest-walls, the less the tendency to bronchitis, pneumonia, and consumption. Nothing is more certain than that small, ill-developed lungs are prone to tuberculosis. Not only do good lung development and chest mobility tend to prevent lung disease, but they place the individual at an advantage should he happen to develop it. In *asthma* the effect of breathing exercises is often striking.

In *heart disease* the exercises are often of marked benefit, for by aiding the circulation of the blood they relieve the work of the heart, and thus conserve its energy.

Great benefit can be derived from breathing exercises in *functional diseases of the nervous system.* By accelerating the flow of blood through the brain they not only increase the supply of oxygen, but they also promote the withdrawal of waste products.

EXERCISE I

Filling the lungs with fresh air as shown in Illustration No. 1 acts like a tonic to the entire system, and is far superior to any that can be purchased. Take a long, deep breath and endeavor to throw the chest forward as far as possible, at the same time throwing the shoulders back. This should be done several times a day, and especially when you are out of doors. If deep breathing is practised faithfully for a few months, several inches of increased measurement will show around the chest. Too much attention cannot be paid to deep breathing, and the performer will find it to his advantage to pay attention to it both during and after the exercises.

EXERCISE II

The exercise of twisting the body from side to side, as shown in Illustration No. 2, strengthens the internal organs and gives free movement to the waist-line. Twist the body first to the right side and then to the left, and when you have twisted it as far as you think you can, then go even a little farther. Reach for some imaginary object. Be sure to keep the feet firm and steady while trying this movement.

EXERCISE III

Illustration No. 3 requires concentration of mind as well as concentration of muscular powers. Pick up an imaginary weight from the floor and put it at arm's length overhead. Imagine the weight you are lifting is far beyond your powers and work accordingly. Strain as if your very life depended upon it. After you have succeeded in getting the weight overhead, then lower it again to the floor. This exercise brings every muscle in your body into play, and the imaginary weight will benefit you almost as much as the real article, providing you concentrate strongly.

EXERCISE IV

Stand erect, with arms stretched out horizontally. Then bend first to the right side and then to the left side as far as you can without bending the knees, as shown in Illustration No. 4. For those troubled with excess fat around the abdomen, this exercise will be of great benefit, and it also aids the internal organs greatly. A strong, square waist can be developed by persistent use of this movement.

EXERCISES V AND VI

A wonderful exercise for developing the chest muscles and the arms is shown in Illustrations Nos. 5 and 6. Lie flat on the floor on the stomach, placing the hands on the floor about even with the chest, as shown in Illustration No. 5. Then, keeping the body rigid, push away from the floor until the position shown in Ill

lustration No. 6 is gained. Do not allow the body to sag at the waist. Continue this exercise until the muscles become thoroughly tired, and be sure to make a complete movement, that is, lower the body to the floor each time, and on the push-up movement stiffen the arms each time. This exercise should be performed with rapidity.

EXERCISE VII

Almost any person can perform the simple exercise shown in Illustration No. 7, as very little practice is required to accomplish this feat. Place the hands on the seat of the chair as shown in the illustration, and lift the body off the seat, keeping the legs entirely stiff and rigid. Hold this position for a few seconds and then relax and repeat. This will give plenty of exercise for the abdominal muscles as well as the arms and the upper thighs. As this is an easy exercise, it should be continued until tired in the parts used.

EXERCISE VIII

Grasp the backs of two chairs and rest on them, having the feet clear of the floor. Keep the arms stiff. Dip down as far as possible, as shown in Illustration No. 8. Then push the body upward until the starting position is assumed again and the arms are straight. This exercise is a trifle more difficult than the preceding one, as it requires the performer to lift the entire weight of the body. It is an excellent movement for developing the chest, arms, and shoulders. Continue this exercise until the muscles used become thoroughly tired.

EXERCISE IX

Chinning the bar. This can be done either on a transom or any other place which affords strength enough to hold your weight. First hang by the hands, with the arms stiff. Then pull slowly upward until your chin touches the height of your hands, as shown in Illustration No. 9. The effect of this exercise can be easily seen on the muscles of the arms. It not only develops the biceps but benefits nearly every muscle above the waist, excepting the triceps (the muscle in back of the upper arm) and the

neck muscles. Continue this exercise until the muscles become thoroughly tired. A little variation can be made by reversing the grasp, making the exercise still more difficult.

EXERCISE X

Illustration No. 10 shows the common deep knee-bending exercise, and in order to derive the most benefit from it, it should be performed in this manner. Starting from an erect position, squat down until you are sitting on the heels; then straighten the legs by pushing vigorously away from the floor. Imagine that your body weighs about twice as much as it really does, and work accordingly. The sets of muscles in the upper leg are exceedingly strong and can stand a great amount of strain, so do not hesitate or be afraid of putting too much effort in the movement. Upon assuming the erect position again, force the knees back hard. This will give the thighs additional work. Continue this exercise until the legs become thoroughly tired. Keep the body in proper posture throughout this movement, as shown in the illustration.

EXERCISE XI

Lie flat on the back on the floor. Stiffen the arms and the legs and then come up to the position shown in Illustration No. 11. In performing this movement do not allow the feet to leave the floor at any time. This exercise will reduce all superfluous flesh around the waist-line and also benefit greatly the digestive organs, and should be practised with regularity by those who wish to bring about this result. Continue the exercise until slightly tired.

EXERCISE XII

The exercise shown in Illustration No. 12 is one of the most difficult to perform, and should not be attempted until you can do the deep knee-bending on both legs, as shown in Illustration No. 10, forty or fifty times without getting tired. It may be necessary to use the hands somewhat to help you to get up for the first few attempts. Naturally, doing the exercise on one leg will develop the muscles quicker than on both legs, as it requires greater strength and effort. Do this exercise as many times as you can without resting.

EXERCISE XIII

Lie on your stomach on the floor, placing the hands behind the hips. Then raise the feet, keeping the legs stiff, and at the same time raise the chest also off the floor. Illustration No. 13 sets forth this exercise in a milder form, that of raising the chest only, keeping the feet to the floor. Beginners, perhaps, should attempt this exercise first before trying to do the entire movement at one time. This exercise will strengthen and invigorate the muscles of the entire back of the body.

EXERCISE XIV

Another excellent exercise for strengthening the neck and the back is shown in Illustration No. 14. Lie on the back on the floor, and with the help of the hands, if necessary, assume the position as shown in the illustration. This will rest the weight of the entire body on the top of the head. Lower the body until the shoulders touch the floor, then assume the head position again. This movement should really be done with the strength of the neck alone. It is not at all difficult but very beneficial. Continue the exercise until slightly tired.

EXERCISE XV

Assume the position shown in Illustration No. 15. Then lower the hips until they touch the floor, but do not allow them to rest on the floor. Then raise the body back to the first position. Continue until slightly tired, and then reverse the body and repeat the exercise for the left side. This exercise strengthens the hips and also the muscles at the sides of the waist.

EXERCISE XVI

Stand erect. Then bend forward until the tips of the fingers touch the floor without bending the knees. After a little practice you will be able to place the palms of the hands on the floor, as shown in Illustration No. 16. Repeat this movement until slightly tired. This exercise will keep the back limber and also develop the muscles behind the thighs.

POISONS

INTRODUCTION

A POISON may be defined as a substance which, on being absorbed into the organs of the body or by chemical action on the tissues, injures health and destroys life. From this it will be seen that, short of actually causing death, a poison may have a very deleterious effect on the general health of the body, such as may lead ultimately to a state of chronic ill health and even death. Cases of poisoning fall into two divisions, acute and chronic. It is usually the former which comes under the care of the renderer of first aid; the latter is more a case for a doctor from the beginning.

Acute poisoning is due to the introduction into the system of a large enough dose of some poisonous substance to cause immediate danger to the life of the poisoned person. In such a case the only hope of successful treatment is in the quickness with which treatment suitable to the case is commenced. No time must be lost in waiting for a doctor; those who are on the spot must do all that they can to prevent the patient from dying before the doctor does arrive. Every moment that the poison is given to work its will in the body increases the danger.

The number of poisons which kill instantaneously is comparatively small; most require a certain length of time for their action to reach its climax, and it is as a result of this highly fortunate circumstance that so much can be done, if it be done quickly. Cases of chronic poisoning, on the other hand, simulate as a rule some general disease, and require for their diagnosis and treatment skilled medical knowledge. In their case there is not the same paramount necessity for speed, though, of course, the sooner the cause of the complaint is dealt with the better.

Antidotes.—An antidote is a substance which counteracts or antagonizes the effect of a poison. Some antidotes act by render-

ing the poisonous substance inert and harmless, owing to the chemical union which takes place between the two substances; others, again, act by virtue of the effect they have on the different tissues of the body, so counteracting the effects of the poisons which have been taken. It will be readily seen that, as the actions of poisons differ the one from the other, so also must their antidotes differ. It is beyond the range of the first-aid student to know the actions of all the substances which may be used as poisons and such as may be used as antidotes. In many cases the two are the same. One poison may require the use of another, whose action is antagonistic to its own, as an antidote; a poisonous dose of the latter will demand the use of the former in its turn. All that the first-aid student requires is a compact and concise list of the appropriate antidotes, so that no time may be lost in the endeavor to find out what is the correct thing to give in any case. While a knowledge of the actions of the substances he is dealing with will make his work all the more interesting, it is not necessary for the efficient performance of his duty. Each of the more important poisons will be discussed and the treatment indicated, with a list of the antidotes to be given in each case.

CLASSIFICATION OF POISONS

It is possible, from a practical point of view, to classify poisons according to their actions and consequent treatment in cases where they have been taken. For this purpose the simplest and at the same time most effective classification is that which divides poisons into the three main groups—corrosives, irritants, and narcotics. A fourth group may be added, the members of which possess the properties of the latter two. This group may be called the narcotic-irritant poisons. Each group has its distinctive features, which are easily recognizable.

Corrosives.—These poisons soften and destroy the parts with which they come in contact, and in this way do serious damage to the parts, usually the mouth, throat, and gullet. Mineral acids and caustic alkalies belong to this class, as do the acid, alkaline, and corrosive salts.

Irritants.—Here the parts are irritated or inflamed, such inflammation often leading to results as disastrous as, though less rapid than, in the previous group. Typical members of this

group are arsenic, antimony, and phosphorus, the essential oils, and animal and vegetable poisons.

Narcotics.—Here the action is a remote one, no effect being caused on the tissues actually in contact with the poison. They act, by being absorbed into the system, on the nervous system, and produce asphyxia, delirium, or convulsions. Notable examples are opium, belladonna, hydrocyanic or prussic acid, alcohol, and poisonous gases generally.

Narcotic-Irritants.—These have an irritating effect on the tissues in addition to their remoter effects on the nervous system. Among narcotic-irritants are included strychnine, aconite, digitalis, and poisonous fungi.

Where the poisoning is due to a corrosive, always look for evidences of the corrosive action on the lips and in the mouth. Any signs of burning or corrosion in these regions, or on the skin of the face and neck, will indicate that a corrosive poison has been taken. This is of the greatest importance, as, owing to the damage which may have been done by the corrosive to the walls of the stomach, it is not safe to give an emetic. If the walls have been eaten into by the poison and so weakened, the giving of an emetic may cause a rupture of the stomach with very serious, if not fatal, results. This is one of the most important points in treating cases of poisoning. In such a case the correct thing to do is to administer some substance which will help to protect the tissues from the action of the corrosive, and to soothe those which have already been injured. Such substances are demulcents, examples of which are milk, eggs, olive oil, and gruel. If there are no signs of burning or staining about the lips or face, it may be assumed that the poison is not a corrosive, or, if such, has been taken in so dilute a form as not to cause any immediate danger from its action on the tissues. In such cases an emetic should be administered.

Before proceeding to the detailed discussion of the various poisons, let us recapitulate the general maxims to be observed in any case which comes under our observation. As soon as it is ascertained that it is a case of poisoning, send a messenger for a doctor, informing him at the same time of the nature of the poison. This will enable the doctor to select the appropriate remedies. Till the doctor arrives, if the nature of the poison has not been ascertained, act on the general principles already

explained. Get rid of the poison as quickly as possible by means of an emetic, except where there is staining or burning of the lips or mouth, or by giving an aperient. If there is shock or collapse give stimulants, such as aromatic spirits of ammonia, strong tea or coffee, and keep the patient warm by means of hot cloths, poultices, fomentations, or the like. Pain can be relieved by applying warmth and demulcents. If the poison is known, the special treatment appropriate is to be adopted, always bearing in mind the golden rule of first aid, to avail oneself of the first thing that comes to hand that is likely to be of any use as a remedy.

EMETICS

Tickling the Throat.—An emetic is a substance which produces vomiting. In many cases this may be done mechanically by tickling the back of the throat. A feather may be used for this purpose, or, what is always at hand, the finger. Open the mouth wide, and keep it open by means of a gag of some sort; the handle of a knife, a piece of stick, or anything similar may be used. Pass the first finger well back into the mouth, and move it gently about over the upper part of the throat. This will be found effective in many cases.

Warm Water.—A drink of warm water may be all that is required; if nothing else is at hand, greasy water which has been used to wash dishes may be used. It is unpleasant and nauseating, which is exactly what is wanted, and is the lesser of the two evils.

Salt and Mustard.—Two teaspoonfuls of common salt in a pint of warm water may be used, or a tablespoonful of mustard. Both may be used in turn. These remedies are usually at hand. Certain drugs have special emetic properties, and may be used. As a rule, they act more quickly and effectively.

Sulphate of Zinc.—One of the commonest is sulphate of zinc, thirty grains of which should be given in a little hot water, the dose being repeated till vomiting is secured.

When vomiting has begun, these same means must be continued till all the contents of the stomach have been evacuated and the water which is given returns quite clear. If one emetic proves useless, try another, when the combined effect of the two

may prove efficacious. As will be seen later, *the only cases of poisoning in which an emetic must on no account be administered are those due to corrosive acids.* In other cases an emetic is always to be given. The best method of emptying the stomach of its contents is by means of the stomach-pump. It is not, however, advisable that this should be used by anyone but a doctor. If the patient has not been made to vomit by the time the doctor arrives, he will probably proceed to empty the stomach by means of the siphon action of the pump. This, however, is rather beyond the sphere of first-aid treatment.

In a great majority of cases of poisoning the first thing to be done is to get rid of the poisonous substance as quickly as possible by means of an emetic. This having been done, it may be advisable to secure a further elimination of the poison by means of an aperient. This causes the rapid transit of the noxious matter through the intestines, and deals with any that has got beyond the reach of the emetic previously administered. The commonest aperient is the old household remedy for all aches and pains, castor-oil, a tablespoonful of which may be given, or even double that quantity, or a dose of Epsom salts.

ANTIDOTES FOR POISONS

Absinthe.—Give an emetic made of one tablespoonful of ground mustard to a teacupful of cold water, followed in a few minutes with black coffee mixed with brandy.

Acetate of Lead.—White of eggs, or milk.

Acetic Acid.—Magnesia-water or chalk, followed with lime-water.

Aconite.—Mustard and water, or sulphate of zinc and water, or salt and water.

Alcohol.—Mustard and water, or salt and water.

Ammonia.—Vinegar and water, or lemon or orange juice.

Antimony.—Salt and water, or mustard and water.

Antipyrine.—Mustard and water, or salt and water.

Arsenic.—Mustard and water, or sulphate of zinc, followed with olive-oil.

Aspirin.—Mustard and water, or salt and water.

Bedbug Poison.—White of eggs, or milk.

Belladonna.—Salt and water, or milk and water.

Blue Vitriol.—Chalk or lime-water, followed with milk.

Camphor.—Mustard and water, or salt and water.

Carbolic Acid.—Milk, or white of eggs, olive-oil, or flour and water.

Caustic Potash.—Vinegar and water, or lemon juice and water.

Cheese.—Salt and water, or mustard and water, followed with a strong purgative, as Epsom salts.

Chloral.—Mustard and water, or salt and water, followed with stimulants, as coffee or brandy.

Chloroform.—Salt and water, or mustard and water, followed with whisky or black coffee.

Corrosive Sublimate.—Salt and water, or mustard and water, followed with the white of several eggs. Repeat the salt or mustard water, if necessary.

Creosote.—Flour and water, or milk.

Cyanide of Potassium.—Salt and water, or mustard and water, followed with black coffee and brandy.

Digitalis.—Mustard and water, or salt and water followed with coffee and brandy.

Ergot.—Salt and water, or mustard and water, followed with a dose of Epsom salts.

Ether.—Salt and water, or mustard and water, followed with coffee and brandy.

Fish.—Mustard and water, or salt and water, followed with a dose of Epsom salts, and whisky.

Fowler's Solution.—Mustard and water, or salt and water, followed with sweet-oil.

Gas.—Admit plenty of fresh air; apply artificial respiration; give dose of brandy.

Henbane.—Salt and water, or mustard and water, followed with brandy.

Ice-cream.—Mustard and water, or salt and water, followed with a strong dose of Epsom salts, and brandy.

Iodine.—Flour and water, or arrowroot and water.

Laudanum.—Mustard and water, or salt and water, followed with strong black coffee.

Lead (Sugar of Lead).—Mustard and water, or salt and water, followed with a dose of Epsom salts.

Lime.—Vinegar and water, followed with flour and water.

Lye.—Vinegar and water, followed with milk or sweet-oil.

Matches.—Mustard and water, or salt and water, followed with milk.

Meats (decayed).—Salt and water, or mustard and water, followed with a dose of Epsom salts, and brandy.

Mercury.—Milk, or white of eggs.

Milk.—Salt and water, or mustard and water, followed with a dose of Epsom salts, and brandy.

Morphine.—Strong black coffee, followed with mustard and salt, one teaspoonful of each in a teacupful of warm water.

Muriatic Acid.—Soap-suds.

Mushrooms.—Salt and water, or mustard and water, followed with a dose of Epsom salts, and brandy.

Nicotine.—Mustard and water, or salt and water, followed with whisky or brandy.

Niter.—Salt and water, or mustard and water, followed with milk or white of eggs and a dose of Epsom salts.

Nitrate of Silver.—Mustard and water, or salt and water in large quantities, followed with white of eggs or milk.

Nux Vomica.—Salt and water, or mustard and water, followed with large quantities of charcoal and black tea.

Opium.—Strong black coffee, followed with mustard and salt, one teaspoonful of each in a teacupful of warm water.

Oxalic Acid.—Chalk or lime, followed with a dose of Epsom salts or castor-oil.

Paris Green.—Mustard and water, or sulphate of zinc, followed with olive-oil.

Potassium Permanganate.—Mustard and water, or salt and water, followed with a dose of Epsom salts or castor-oil.

Prussic Acid.—Strong black coffee. Let patient inhale spirits of ammonia. Douse cold water on head and back.

Rat Poison.—Mustard and water, or salt and water, followed with white of eggs or milk.

Strychnine.—Mustard and water, or salt and water, followed with large quantities of charcoal.

Sulphuric Acid.—Immediate use of large drinks of soap and water, lime-water, or baking-soda and water, followed with milk or white of eggs.

Tartaric Acid.—Chalk or lime-water should be given in large quantities, and should be followed with a dose of Epsom salts or castor-oil.

Tobacco.—Mustard and water, or salt and water, followed with a dose of Epsom salts or castor-oil.

Turpentine.—Mustard and water, or salt and water, followed with a dose of Epsom salts or castor-oil.

SYMPTOMS AND TREATMENT OF POISONS

Acids.—Although most acids have an extremely sour and burning taste, which warns a person of his error before very much is swallowed, still several are so much used in commercial processes, and so easily obtained, that accidental and intentional poisoning by acids is not uncommon.

Symptoms.—The symptoms produced are destruction of the skin and mucous membrane about the mouth, great pain in the mouth, throat, and stomach, and sometimes fainting or collapse. These are especially the symptoms of poisoning by strong mineral acids, or by citric or tartaric in large quantities, while several, such as prussic and carbolic, have symptoms peculiar to themselves and not due to irritation.

Treatment.—The treatment is to give alkalies in large quantities of water. Baking-soda, plaster scraped off the walls, or soap, is always at hand. These neutralize the acid taken and form harmless salts, and also soothe the irritated mucous membrane; but to be of use they must be given at once, so as to stop further action of the acid, and the longer the delay in giving them, the less effective they are. Also, one must give soothing or demulcent substances, such as milk, oil, or barley-water.

Aconite.—Poisoning may occur by children eating parts of the plant, or by the administration of too large a dose.

Symptoms.—There are characteristic symptoms in the mouth after chewing parts of the plant. If a large amount of the poison has been taken into the stomach, vomiting and purging follow after some time. Numbness is felt all over the body. The pulse becomes weak, the breathing labored, and the face livid. Convulsions may come on, but consciousness is retained.

Treatment.—The poison must be got rid of at once by an emetic, one of the handiest being a tablespoonful of mustard in a cupful of cold water; or, best of all, one or two tablespoonfuls of aromatic spirits of ammonia in water, this being also a stimulant. Stimulants such as ether may be hypodermically injected,

or brandy may be given by the mouth with black coffee or strong tea after the vomiting has stopped.

Ammonia, Spirits of Hartshorn.—Solutions of ammonia are used in households for purposes of cleaning, and may be taken internally by mistake.

Symptoms.—There is a burning pain in the mouth, nose, and throat; the lips and tongue become parched and swollen. There is intense pain in the chest and stomach, and the patient suffers very severely. There may be a troublesome cough and vomiting, the contents of the stomach being mixed with blood.

Treatment.—The antidote to ammonia is an acid. The most convenient and most likely to be available is vinegar, which should be well diluted with water. Any weak acid which is at hand may be used, but always in a very weak solution. Failing this, the juice of oranges or lemons may be used. To soothe the injured tissues give white of egg and water or milk, olive-oil, or any other oil which is at hand, gruel, or arrowroot.

Antipyrine, or Phenazone.—This is a white powder, used largely for the relief of headache or neuralgic pains generally.

Symptoms.—The symptoms are pain in the stomach, with retching and vomiting. The pulse becomes weak, the breathing is rapid, and a condition of asphyxia may develop in consequence of the embarrassed breathing. There may be great swelling of the face, neck, and eyelids, much sneezing, and copious watery discharges from the nose and eyes.

Treatment.—An emetic, such as one tablespoonful of mustard to a teacupful of cold water, should be given, and warmth applied to the extremities. Free access of pure air should be secured, and in cases where the asphyxia is extreme it may be necessary to have recourse to artificial respiration.

Arsenic, Arsenious Acid, White Arsenic.—This is one of the most commonly used poisons, and is a highly dangerous substance. It is used medicinally in small doses, and is a valuable tonic.

Symptoms.—The symptoms usually come on rapidly, generally in considerably less than an hour. The patient feels faint and weak, and there is a burning pain in the stomach, with retching and vomiting. The vomited matter is usually brown in color, and mixed with blood.

Treatment.—First of all an emetic must be given, either

mustard and water or sulphate of zinc, a tablespoonful of the former or a small teaspoonful of the latter. Quantities of greasy water or of soap and water may also be given, and the whole of the poison thus removed from the stomach. Oily substances should be given to soothe the irritated tissues—olive or castor oil, or the mixture of equal parts of linseed-oil and lime-water known as carron-oil and used for burns.

Aspirin.—This substance is largely used medicinally for headaches, colds, and rheumatism.

Symptoms.—In cases where an excessive dose has been taken or administered, the face becomes enormously swollen, as are the lips and tongue, the latter so much so that it cannot be protruded. The eyelids become so swollen that the eyes are closed up, and, owing to the swelling of the throat, speech becomes difficult and there is great interference with the breathing.

Treatment.—If the swelling is not so great as to prevent swallowing, give a mustard-and-water or other emetic and apply fomentations to the neck. If there is serious interference with the breathing, it may be necessary to perform artificial respiration, while in extreme cases, owing to the swelling of the throat and larynx, it may be necessary to have a doctor perform tracheotomy.

Bedbug Poison.—Give white of eggs or milk in large quantities.

Belladonna Atropine.—This drug is obtained from the plant called the deadly nightshade.

Symptoms.—The mouth becomes extremely dry and the thirst is intense. All the secretions are stopped, especially saliva. There is great difficulty in swallowing. The face becomes flushed and the eyes prominent. The condition of the pupils of the eyes is characteristic: they are widely dilated and have a sparkling appearance. Vision becomes blurred and indistinct. The patient becomes wildly excited and may be delirious. The muscles become weak, and the gait is unsteady and tottering, the person falling down in his endeavors to walk.

Treatment.—Speedy treatment, even in very severe cases, is here attended with marked success. Deaths from belladonna poisoning are comparatively rare. An emetic should be administered at once, mustard and water or salt and water if no other emetic substance is at hand.

Camphor.—This is used in lumps to protect clothes from moths, etc., and is also medicinally in oil and liniment. Children may eat a camphor ball which has come into their possession, or the medicinal preparations, intended for external use, may be taken internally.

Symptoms.—The patient has a strong odor of camphor in his breath, becomes faint and giddy, has noises in the ears and dimness of vision. The features become sunken, the skin is cold and clammy; there may be delirium and convulsions. The bladder is irritated, and there is increased desire to pass urine. The pulse becomes weak and the breathing labored.

Treatment.—Give an emetic of salt and water or mustard and water, and treat the collapse by applying warmth. Stimulate by means of hot and cold douches, and give hot coffee by the rectum. It is not advisable to give spirits by the mouth, as camphor is readily soluble in spirits, and is thus more easily absorbed.

Carbolic Acid.—Poisoning by carbolic acid, due to accident or suicide, has become fairly common since the use of the acid for disinfection and dressing wounds became general.

Symptoms.—If the acid has been swallowed there is a sense of burning about the mouth and throat, followed by numbness, and the skin and mucous membrane of the mouth show white where the acid has touched them. Unconsciousness and stupor soon come on, and death follows usually after an interval of a few hours.

Treatment.—Olive-oil, or any fatty substance like milk or cream, or flour and water, should be administered at once, and the stomach washed out or emptied by an emetic in several glassfuls of tepid water.

Chloral.—Poisoning from the use of chloral is by no means infrequent, because, the sleep-producing effect of the drug passing off after repeated administrations, the sufferer takes a larger dose than his heart can stand.

Symptoms.—Occasionally, though seldom, there is gastric pain and sickness after a large dose. Usually the result is a speedy and deep sleep, passing gradually into coma, the pulse growing feeble, and the respirations embarrassed till death peacefully ensues.

Treatment.—The patient must be persistently irritated and

roused. The stomach should be at once emptied by stomach-tube or emetic. The extremities of the body must be kept warm, and stimulants, like alcohol or coffee, freely given. Both strychnine and nitrite of amyl are to a slight extent antidotes.

Corrosive Sublimate.—This is a strong antiseptic, and is much used as a disinfectant.

Symptoms.—There is a metallic taste in the mouth, with a feeling of constriction in the throat. There is much pain in the stomach, and sickness and vomiting. There is severe purging, the motions as well as the vomited matter being stained with blood. The lips and tongue are stained white.

Treatment.—Give an emetic and stimulate freely. Treat the collapse in the usual way. Give demulcent drinks to soothe the tissues. The antidote is white of egg or egg albumen. Mix this with water and give in large quantities. Repeat the emetic after giving the antidote.

Cyanide of Potassium.—This is a powerful poison, being allied to prussic or hydrocyanic acid. It is used in photography and in certain plating processes.

Symptoms.—The symptoms appear almost immediately, and are very severe. There is great pain and burning in the stomach, and foaming at the mouth. The limbs become weak and powerless, and ultimately exhibit convulsive movements. The breathing is affected, becoming very irregular. There are spasms of the muscles, causing stiffness of the jaws and body generally, and death ensues rapidly.

Treatment.—Give an emetic and stimulate freely. If the power of swallowing be lost, hot coffee with brandy must be given by the rectum. Hot and cold douches should be given, and artificial respiration if the breathing shows signs of failing. The antidote is sulphate of iron, known as green vitriol. This must be given in large quantities in water.

Digitalis, Foxglove.—Digitalis is a drug prepared from the plant foxglove, which grows wild in this country and is also cultivated in gardens.

Symptoms.—The symptoms of an overdose are vomiting of green-colored water and severe purging, with pain in the abdomen. The heart is chiefly affected, the pulse becoming slow and irregular. The great danger is sudden failure of the heart's action. The pupils of the sufferer's eyes become dilated, there

are pains in the head, the skin becomes cold, and sweating is profuse.

Treatment.—The drug must be stopped at once if, after the pulse has been slowed down, it begins to quicken while the drug is still being taken. If a single large dose has been swallowed an emetic should be given, followed by stimulants, warmth to the extremities, and strict maintenance of the recumbent position.

Ergot.—This drug is given in the vain hope of procuring abortion. This can only be done by doses of such quantity as to cause serious ergot poisoning.

Symptoms.—The signs commence with tinglings in the hands and feet, followed with cramps in the arms and legs. The body feels cold all over, the pulse is small, and the pupils of the eyes are dilated. There may be sickness and vomiting as well as purging.

Treatment.—Give an emetic and also an aperient, either castor-oil or Epsom salts. Stimulants should be given, and the patient kept warm in the recumbent position. The antidote is tannic or gallic acid in half-teaspoonful doses, or strong tea or coffee.

Fish.—See Ptomaine.

Food.—For poisoning from all kinds of foods, see Ptomaine.

Gas.—Remove the patient to the air, and use artificial respiration. Place hot applications to the lower extremities and send for a physician.

Hyoscyamus, Henbane.—Poisoning may occur through the plant being mistaken for parsnips, or through the seeds being used by mistake in cooking.

Symptoms.—The symptoms consist of great excitement, flushed face, and a strong pulse. The patient becomes giddy and loses the power of his legs.

Treatment.—Give an emetic, follow with brandy, and send for a physician.

Lead, Sugar of Lead, Lead Acetate, White Lead, Diachylon.—Lead poisoning is much more common in the chronic form than in the acute.

Symptoms.—The symptoms of acute poisoning are a metallic taste in the mouth, with great thirst. There are severe colicky pains in the abdomen, the muscles of which are hard and rigid.

Severe cramps with ultimate paralysis occur in the legs. The skin is cold, and there may be convulsions and delirium. Death may take place from collapse.

Treatment.—Give an emetic. The antidote is sulphuric acid: this may be given as half a teaspoonful of the dilute acid. Failing this, Epsom salts should be given in half-ounce doses. Demulcent drinks, as milk or gruel, should be given, and poultices should be applied to the abdomen.

Morphine.—This is the typical narcotic poison, being one of the active constituents of opium.

Symptoms.—The symptoms are peculiar. There may be an initial stage of mental excitement and increased physical power. This soon passes off, and is succeeded by a stage of depression. The mouth becomes dry, and great thirst is experienced. Severe headache ensues, and the limbs become heavy. The patient becomes dull, lethargic, and sleepy. Soon he falls into a deep sleep, from which he can with difficulty be aroused. The pupils of the eyes are contracted and look like pin-points; the skin is cold and clammy, and the patient is limp and flaccid. The pulse becomes weak and feeble, the respirations slow and labored and almost imperceptible. Finally death ensues from failure both of the heart and the respiration.

Treatment.—Give black coffee and follow with an emetic. There may be great difficulty in encouraging vomiting in cases of morphia poisoning, but emetics should be persevered with. Give an ounce or two of a dilute solution of potassium permanganate, and follow with another dose of the emetic. This process may be repeated several times. When the stage of depression appears, every effort must be made to prevent the patient falling asleep. This is best done by keeping him walking about and shouting at him. He should be flapped with a wet towel and have hot and cold water poured alternately over him. Aromatic spirits of ammonia should be poured on a handkerchief and given to him to inhale. If there are signs of failure of respiration, artificial respiration must be employed. The antidote is atropine, which should be given hypodermically, or a teaspoonful of tincture of belladonna may be given by the mouth.

Mushrooms.—See Ptomaine.

Niter, Saltpeter, Potassium Nitrate.—This may be taken accidentally in mistake for Epsom salts.

Symptoms.—The symptoms of poisoning are pain in the abdomen with vomiting and purging. The skin becomes cold, the limbs shaky, and later paralyzed. There may be great collapse, and finally convulsions.

Treatment.—Give an emetic of mustard and water or salt and water, and demulcent drinks, as milk, white of egg, oil, or gruel. If there is much collapse, as indicated by the weakened pulse, give brandy. Keep the patient warm by means of hot fomentations, hot blankets, or hot-water bottles. Rub the limbs, and keep him in the recumbent position.

Nitrate of Silver, Lunar Caustic.—This is used as an external application or to the mucous surfaces of the lips and tongue.

Symptoms.—The symptoms of poisoning are principally vomiting, the vomited matter turning black on being exposed to the light. The throat and stomach are irritated and painful.

Treatment.—Give an emetic, and large quantities of common salt dissolved in water. Demulcent drinks—milk, gruel, or white of egg—should also be given.

Nitric Acid, Aqua Fortis.—Not only is the acid itself a powerful poison, but also the fumes from the concentrated acid.

Symptoms.—The symptoms are those of a corrosive poison. They usually come on immediately. There is intense burning pain in the mouth, throat, and gullet, with severe vomiting. The lips are usually stained a yellow or brown color. The vomited matter is stained with blood and has a yellowish appearance. Owing to the corrosive action of the acid the soft parts of the mouth and throat are much injured, so that speaking and swallowing are painful. The pulse is weak and irregular, the skin is cold and clammy, and the breathing is embarrassed.

Treatment.—Give large quantities of soap and water, washing-soda. Ammonia, magnesia, or lime-water should be given, but no emetic. These alkaline substances are the antidotes to the acid. Any kind of demulcent drinks must be given to soothe the tissues, as oil, milk, white of egg, or gruel. Apply fomentations to the stomach, and guard against shock by keeping the patient warm.

Nux Vomica.—This substance is used in medicine, the chief active principle being strychnine. The powder is used as a vermin killer, and may be given by mistake or by design, as also may the seeds.

Symptoms.—Convulsions come on very speedily after the poison has been taken. These convulsions are brought on by slight causes and the sufferer becomes quite flaccid between them. The mental faculties remain unaffected and the symptoms end in death or recovery within a few hours.

Treatment.—Administer an emetic, if it is possible to do so, before the fits come on. If the convulsions have appeared, the only thing that can be done is to keep them in check by chloroform inhalation or by large doses of chloral, until the strychnine has been excreted from the system. This is effected by the kidneys, the strychnine leaving the system in the urine.

Opium.—This substance is one very widely used in medicine. The chief active principle is morphine, which is derived from opium. This is itself derived from poppies, and symptoms of poisoning may follow the eating of the leaves or seeds of these plants.

Symptoms.—The symptoms of opium poisoning are the same as already described under Morphine. They are typically those of a strong narcotic poison.

Treatment.—The treatment is also the same. An important point to bear in mind in this connection is the fact that children bear opium very badly, a very small dose being sufficient to cause serious symptoms in a young child. Also, in the case of a person found unconscious, opium poisoning must always be considered as one of the possible causes. It must be distinguished from the unconsciousness produced by totally different causes—alcohol, apoplexy, concussion, uremia, and the like. The great distinguishing feature about opium poisoning is the very small size of the pupils of the eyes.

Oxalic Acid.—This may be mistaken for magnesium sulphate, Epsom salts, or sulphate of zinc. It is widely used for cleaning purposes and may be found in most households.

Symptoms.—The symptoms vary. In certain cases there may be prompt collapse, and death may follow with startling suddenness. Usually, however, there are premonitory signs and symptoms. There is a burning pain in the throat, gullet, and stomach, with vomiting of dark-colored matter stained with blood. There is also considerable purging. The patient becomes collapsed, the pulse is small and weak, and convulsions may usher in the end.

Treatment.—Alkalies should be given at once. Chalk and lime are the most convenient. Lime from the walls of a room may be used with success, failing any other source of supply. This should be followed with a dose of castor-oil or other purgative. The usual precautions against collapse should be adopted.

Paraffine Oil, Petroleum.—This may be taken in mistake for something else, or deliberately in a fit of anger.

Symptoms.—There is an intense burning pain in the throat, gullet, and stomach, with great thirst and often vomiting. The breath smells strongly of paraffine. The face becomes pale and drawn, the skin is cold and clammy, the pulse is weak, and the respirations feeble. The vomited matters have some of the paraffine mixed with them, appearing as grease-spots.

Treatment.—Give an emetic, and follow with demulcent drinks. There is no special antidote; efforts must be made to keep the patient warm, and stimulants should be freely given.

Paraldehyde.—This substance is used as a sedative and hypnotic.

Symptoms.—The symptoms consist of deep sleep, going on to unconsciousness, with contracted pupils and rapid collapse. The diagnosis is easily made from the peculiar smell of the paraldehyde in the breath.

Treatment.—Give an emetic and prevent the patient from falling into the deep sleep by making him walk about and by rousing him by every means which can be thought of. In cases of respiratory failure, perform artificial respiration.

Phenacetine.—This powder is much used for headaches and neuralgic pains.

Symptoms.—An overdose causes increased headache, with vomiting and diarrhea and increasing difficulty in breathing.

Treatment.—Give an emetic, and follow with a dose of castor-oil. Keep the patient in the recumbent position and apply warmth to the body and limbs. Stimulants should be given, and, if necessary, artificial respiration performed.

Phosphorus.—This substance is of special importance owing to its use in the preparation of matches, which are to be found in every household and may be sucked by children.

Symptoms.—The symptoms of acute poisoning consist in the taste of garlic in the mouth, pain in the throat and stomach, with vomiting. The vomited matters should be examined in a dark

place, when the phosphorus will be seen to glow—an aid to the diagnosis. The pulse becomes weak and rapid, and there may be bleeding at the nose and gums. The patient becomes collapsed and delirious, and may be unconscious.

Treatment.—Empty the stomach by means of an emetic, and give mucilaginous drinks. The antidote is sulphate of copper, five grains of which should be given repeatedly in water. A dilute solution of potassium permanganate should be given. Follow this with a dose of castor-oil, Epsom salts, or other purgative. Do not give oily or fatty substances, as the phosphorus, being more soluble in them, is the more readily absorbed.

Potassium Permanganate.—This substance is largely used as a disinfectant and as a staining agent, and may be taken internally by mistake.

Symptoms.—The lips, tongue, and mouth are stained a dark brown, and are very painful. There is great pain in the stomach, with sickness and vomiting. The pulse becomes weak and the heart fails rapidly, leading to death from heart-failure.

Treatment.—Give an emetic, and follow with a dose of Epsom salts or castor-oil. Keep the patient in the recumbent position, and apply warmth by means of hot blankets, fomentations, and hot-water bottles. Give stimulants to prevent the threatened heart-failure.

Ptomaine.—Ptomaine poisoning is the general name given to cases in which persons become seriously affected as the result of eating meat, fish, cheese, and other substances which have undergone some decomposition. These serious effects are usually due to the formation of animal alkaloids, known as ptomaines, in consequence of the action of bacteria upon the albuminous materials contained in the food. These animal alkaloids have in many cases been separated from decaying flesh, and also from excretions of the body, and their chemical analysis proves them to be very similar to the poisonous alkaloids found in many plants.

Many of these alkaloids are developed within the living body as the result of its activity or of the presence of disease-producing bacteria. So long as the body maintains its health these are discharged by the excretory organs or destroyed by the oxygen circulating in the blood.

They are formed in large quantities in meat which has been

kept too long; different bacteria and different kinds of meat furnishing the various alkaloids. Among the meats which on keeping have produced the most serious effects are ham, pork, sausages, canned tongue, salmon, sardines, etc., meat-pies of various sorts, chicken broth, fish, shell-fish of different kinds, cheese and butter.

The food may go bad by prolonged keeping either before or after it is cooked, cured, canned or otherwise treated for preservation, but thorough cooking tends to lessen its hurtful properties.

Symptoms.—Minor degrees of ptomaine poisoning are of every-day occurrence, and slight attacks of diarrhea accompanied by feverishness and torpor, following upon the consumption of some of the above-mentioned articles, come within the experience of almost everyone. In severer cases, the poisonous foods act as narcotico-irritant poisons. The symptoms set in shortly after a meal, and consist of nausea, vomiting, and purging, with very offensive stools. There are also nervous symptoms, such as great prostration, feverishness, headache, muscular cramps, and drowsiness, proceeding now and then even to death.

Treatment.—The danger of ptomaine poisoning is largely prevented by the public health authorities of well regulated towns, who enforce the inspection of shops where meat is sold and of factories where canned meat, sausages, and the like are made. Scrupulous cleanliness of such places should be insisted on, and all unsound meat destroyed. Smoking and salting afford some protection, and cooking a still greater degree, but it must be remembered that sound meat may go bad when kept for long after cooking, canned meats being apparently specially liable to change.

The treatment of mild cases of poisoning consists in the administration of a purgative, such as castor-oil, calomel, or Epsom salts, to remove the decomposing material from the system. In more serious cases, an emetic should be given as soon as possible, if the symptoms have come on shortly after a meal; and stimulants such as brandy or hot coffee are generally necessary.

Strychnine.—This is the active principle of nux vomica. It is largely used in medicine, and is a constituent of many rat pastes.

Symptoms.—The body is thrown into spasms, all the muscles being contracted. These convulsions come on one after the other, and may finally become continuous. The muscles of the neck are so contracted that the head is drawn powerfully back, those of the trunk and legs to such an extent that the back is arched and the patient rests on the back of his head and on his heels, with the body rigid in a stiff curve.

Treatment.—Give an emetic if the patient can swallow. This should be followed by giving large quantities of charcoal or wood cinders. Tannic acid may also be given, or tincture of iodine. Strong black tea will answer if nothing else can be obtained. Chloroform should be poured on a handkerchief or towel and placed over the patient's mouth and nose to overcome the spasm. If it is at all possible, perform artificial respiration. The antidote is bromide of potassium. Half an ounce of this may be given in water by the mouth or injected into the rectum. This should be repeated every quarter of an hour so long as the convulsions continue. Death by bromide poisoning is a much less distressing and less painful thing than by strychnine. Do not be afraid to administer bromides in abundance.

Sulphonal.—This is a purely hypnotic substance. It acts slowly, and is slow to be excreted from the body.

Symptoms.—The acute symptoms consist of giddiness, headache, and disturbance of the mental functions. The muscles of the legs become weak and uncontrolled in their action, so that walking or even standing is a matter of difficulty. The patient has the appearance of being drunk, goes off into a deep sleep, and becomes insensible. There is profuse sweating, but no urine is excreted. Death may come on quite suddenly after some time.

Treatment.—Give an emetic, and follow by a dose of castor-oil or Epsom salts. Stimulants should also be given, and the patient roused as much as possible. Guard against collapse, as already shown.

Sulphuric Acid, Vitriol.—This may be taken by mistake, and is frequently used for suicidal purposes.

Symptoms.—The symptoms are those of corrosive poisoning. There is a burning pain from the mouth to the stomach; the lips and tongue are dry and parched, and are stained white in color. There is severe vomiting, the vomited matters being dark and

stained with blood. The pain is very acute, the skin is pale and cold, and perspiration is profuse. There is much collapse and ultimately unconsciousness, passing on to death.

Treatment.—No emetic, as it is a corrosive poison. Large drinks of soap and water, or chalk or lime and water, should be given. Magnesia, baking or washing soda should be given well diluted with water. Demulcent drinks should also be given—milk, white of egg, gruel, etc. Hot poultices should be applied to the abdomen to relieve the pain, and the patient kept warm by every available means. Stimulants should be given when there is any sign of collapse or heart-failure.

Tartaric Acid.—This is found in all households, and may be taken in mistake for salts.

Symptoms.—It causes great pain in the stomach, with vomiting. Convulsions may be succeeded by collapse and unconsciousness, which goes on to a fatal issue.

Treatment.—Chalk or lime and water should be freely given, and a dose of Epsom salts or castor-oil to clear out the poison. Apply hot poultices to the abdomen, and adopt the usual measures to combat collapse.

Tobacco, Nicotine.—Tobacco poisoning may arise from chewing or from an overdose being given as an emetic.

Symptoms.—The symptoms are an intensification of those experienced from smoking too strong tobacco. There is great nausea and feeling of sickness, with vomiting. The skin becomes cold and clammy and covered with cold perspiration. The eyes become affected; the vision is blurred. The pupils are contracted at first, and later are dilated. The pulse becomes weak, and there is faintness and collapse.

Treatment.—Give an emetic, and then a dose of Epsom salts or castor-oil. Strong tea or tannic acid should be given frequently. Nicotine has a paralyzing effect on the heart, which must be stimulated. Strychnine should be given hypodermically. Brandy or aromatic spirits of ammonia should also be given. The patient must be kept in the recumbent position, and warmth should be applied, as well as friction to the extremities. Be careful to keep the patient lying down for a considerable time, even after recovery is apparent, as any strain on the heart may have disastrous results.

Turpentine.—This is occasionally given in too large doses to expel worms, or may be taken by mistake.

Symptoms.—There is a strong odor of turpentine in the breath, and any urine that is passed may smell of violets. The patient becomes giddy, the pupils are contracted, the breathing is embarrassed and noisy. There may be collapse and convulsions. In some cases great pain is experienced.

Treatment.—Give an emetic—mustard and water or salt and water—and a purgative of castor-oil or Epsom salts.

DISEASES OF THE EAR AND THE EYE

DISEASES OF THE EAR

TROUBLES connected with the ear should, when possible, be early treated, both on account of this organ's importance, and because, owing to its delicacy and inaccessibility, little can be done for unpleasant symptoms like deafness and ringing due to advanced disease. There are several simple procedures connected with the management of the ear which demand explanation.

Syringing is done with a large-sized glass or metal syringe provided with a short point (not longer than one inch, so that no damage to the drum can result). The auricle is pulled gently up and back while a steady stream from the syringe is directed along the upper wall, and flows out along the lower one.

Inflation of the middle ear is performed for cases in which the Eustachian tube is partly blocked, and the drum indrawn. A catheter is passed along the floor of the nose into the opening of the Eustachian tube in the throat, and forcible inflation made through this by means of an india-rubber bag. Or the bag is used to blow up one nostril, the other being closed, while the Eustachian tube is kept open by one of the following devices. The person swallows a mouthful of water, or pronounces some guttural, such as "Huck," so as to raise the soft palate and close the opening between the nose and throat; and at this moment the bag is suddenly squeezed. The middle ear may also be inflated by forcibly expelling air from the chest while the mouth and nose are closed. The fact of whether air enters the middle ear becomes plain to the person himself by a click followed by a slight ringing in the ear, and often by improved hearing, and to the surgeon by means of an india-rubber tube, a couple of feet

long, connecting his ear with the patient's ear, through which he hears the click of the distended drum.

Tuning-fork test is used to test the internal ear. When a vibrating fork is placed on the center of the forehead it is heard equally in both ears, the sound being conducted through the bones of the head. If one ear be closed, it is heard better in that ear. Accordingly, if one ear be deaf, and the sound of the fork placed on the forehead is heard better in that ear, the deafness is due to middle-ear disease. While, if the ear be deaf to the fork when placed on the forehead, as well as when held near the ear, the internal ear or nerve mechanism is at fault.

BOILS IN THE EAR

Boils in the skin lining the outer ear give rise to intense pain. This pain is much relieved by running gently into the ear a quantity of warm carbolic acid solution (one part carbolic acid to forty parts of warm water). A teaspoonful of warm olive-oil introduced into the ear will also usually give relief.

℞ Carbolic Acid ..... two drops
Tincture of Iodine..... one teaspoonful
Glycerine ..... one-half ounce
Mix.
Directions: Moisten a piece of absorbent cotton and place it in the ear against the boil.

DEAFNESS

Deafness, although generally due to some trouble in the ear, is of many different types, and is an unfortunate complaint in that few cases of long standing admit of beneficial treatment.

Varieties and Causes.—Deafness is divided into three classes, according to the section of the ear at fault, and this division is of great practical importance, because, while the external ear is readily accessible for examination and treatment, the middle ear requires most delicate manipulation, and the internal ear is beyond the reach of any remedies other than general ones.

External ear is the passage, about one and a half inches in length, leading inward from the surface to the drum. When the

deafness has its cause in this part, it is due simply to obstruction of the passage by a tumor, by a foreign body, such as a pea, or a polypus, or, most commonly of all, by a plug of hardened wax. In fact, the vast majority of cases of deafness, accompanied by ringing in the ear, are due to the presence of wax.

Middle ear is the drum, or tympanum, separated by the tympanic membrane from the outer ear and communicating with the mastoid antrum, a hollow in the skull, behind, and with the Eustachian tube, which leads to the throat, beneath. These communications are important, because the connection with the throat explains the deafness that accompanies cold in the head, and other forms of inflammation which spread from the nose and throat up into the middle ear; while the connection with the antrum shows why suppuration in the antrum causes great destruction of the delicate mechanism in the middle ear. Acute inflammation in the throat, for example in scarlatina and measles, or chronic conditions like adenoids in children, are very liable to produce middle-ear disease, perforation of the drum, and deafness. Tearing of the drum in consequence of a box on the ear, or of an explosion, as a rule heals and leaves no deafness; but a perforation, following inflammation in the antrum or middle ear, is accompanied by suppuration, discharge from the ear, and other changes, and generally attended by impairment of hearing. When fat people become deaf the condition is sometimes due to a deposit of fat actually pressing on the Eustachian tube, and preventing the entrance into the middle ear of air, which is necessary for good hearing. It is a peculiarity of deafness in middle-ear disease that the hearing is often better during a loud noise; for example, a conversation is more clearly heard while church bells are ringing or in the noise of a railway train.

Internal ear and brain constitute the perceptive apparatus for sound, the outer and middle ear forming parts of the conducting apparatus. Certain fevers which affect the brain, like typhus and typhoid, tumors of the brain, meningitis, mumps, and fractures of the base of the skull may all bring on a greater or less degree of deafness by interference with this perceptive apparatus. Some drugs produce a temporary deafness, notably quinine and salicine. Boiler-maker's disease is a condition of deafness due apparently to a gradual wearing out of the nervous mechanism by the constant noise of hammering, and comes on

in a few years, especially in boiler-makers, but also in sawyers, threshing-mill tenders, and persons similarly subject to constant noise. Hereditary deafness comes on in several members of some families about middle life, owing to hardening changes in the inner ear, and practically defies all treatment.

Treatment.—Deafness due to causes in the external ear is readily dealt with, and, considering the frequency of hardened wax, it is a good and safe procedure to syringe out the ear with a glassful of warm water containing a teaspoonful of baking-soda (bicarbonate). The stream of water is directed along the upper wall of the passage and flows out below. In cases where deafness accompanies nasal catarrh, adenoids, enlarged tonsils, etc., these conditions must be remedied by nasal douches, gargles, operation, etc. In a case of perforation of the drum, accompanied by a chronic discharge, particular care must be taken to keep the ear clean, because there is otherwise a danger, not only of increased deafness, but of retained matter infecting some neighboring part, and causing dangerous abscess in the brain, meningitis, or suppuration in the mastoid antrum. Boiler-maker's deafness generally improves if the occupation be changed, otherwise it grows steadily worse. Deafmutism is a condition where deafness has been complete from early life, usually from birth, and the child has never learned to speak, though its voice-producing organs are perfect. Such children may, with patience, be taught to carry on a fluent conversation by means of lip-reading or by the finger language and signs.

Various aids to hearing have been devised for use in middle-ear deafness. Speaking-tubes and trumpets give some help. Artificial drums are extremely useful in certain cases, especially where there is a large perforation, and one of the best consists simply of a piece of tightly rolled absorbent cotton pushed in so as to rest lightly on the remains of the drum. An audiphone, which is a fan-like instrument made of vulcanite, placed against the teeth in order to send the sound-waves through the bones of the head direct to the ear, has sometimes been found useful.

DISCHARGE FROM THE EAR

Discharge from the ear may arise in the external ear as the result of eczema, boils, or the irritation caused by a plug of wax or for-

eign body, but, in the absence of these, comes in the great majority of cases from a chronic suppuration in the middle ear through a perforation in the drum. The suppuration may begin in an acute inflammation of the middle ear arising in the course of a cold in the head, or may result from scarlet fever or measles, or may be due to disease of the bone in or around the ear, or may simply have a slow onset, without apparent cause, in weakly persons, especially in children. The discharge may be thick and yellowish in cases which are fairly acute, or thin and watery in cases which are improving, or brownish and evil-smelling in cases which have been neglected or in which the bone is diseased. There are two common fallacies regarding this condition. One is that a discharge from the ear is a trifling thing, and that, on the whole, it is undesirable to take means to cure it. In reality, the presence of suppuration is accompanied usually by increasing deafness, and is attended always by the risk of an abscess in the mastoid antrum, or even within the skull. The other fallacy is that a perforation in the drum necessarily entails great deafness. As a matter of fact, unless the perforation be so large as to interfere with the tension of the drum, it causes little interference with hearing, the real cause of deafness in suppurative middle-ear disease being adhesions which bind down the ossicles and prevent their movements.

Treatment.—In the treatment of a case of suppuration, the most important point is to keep the outer ear clean by syringing, which is done, as a rule, with boracic acid solution. For the reduction of the discharge, three methods are in vogue, according to the circumstances of the case: (1) The use of instillations is carried out by dropping into and holding in the ear for fifteen to twenty minutes some astringent fluid, such as alcohol or solution of silver nitrate. This is repeated every day or every few days, and is most successful in cases where the discharge is thin and small in amount. (2) The dry method is performed by syringing, and then carefully mopping out the outer ear with absorbent cotton. Next, powdered boracic acid is blown in by a quill, and gently pressed down under absorbent cotton. This is repeated next day or after a few days, as soon, in fact, as the discharge has soaked through the powder. (3) The absorbent method is simplest, and is most easily borne by a tender ear. It consists, as in the others, in cleansing the ear by syringing, and

then gently pushing in a wick-shaped piece of absorbent cotton. The latter must be changed two or three times each day. If these methods fail, it may be necessary for a surgeon, in bad cases, to remove the ossicles and remains of the drum, and so to convert the middle ear into a simple cavity, which can be easily kept clean. Removal of the malleus and incus does not necessarily produce great deafness; indeed, the hearing may be improved after this operation.

℞ One-per-cent. Solution of Silver Nitrate.
DIRECTIONS: Use in ear with syringe night and morning.

Or:

℞ Powdered Boric Acid.....two teaspoonfuls
Powdered Borax .....one half teaspoonful
Mix.
DIRECTIONS: Blow small amount into ear each night.

EARACHE

Earache is in general due to acute inflammation in the middle ear, but may also be due to chronic inflammation, or to boils, eczema, wax, or neuralgia affecting the outer ear. Pain in this region may also be caused by decayed teeth.

Treatment.—The treatment varies, of course, with the cause, but the pain may generally be relieved to some extent by applying hot flannel or a hot-water bag to the side of the head, by dropping two or three drops of laudanum from a warm teaspoon into the ear, or by running hot salt solution (a teaspoonful to every glass of water) into the ear every two hours through a siphon douche. A leech applied to the skin in front of the ear, or a small blister behind it, often gives relief in severe cases. The ear should not be syringed, which is very painful in a case of inflammation, nor should oil be dropped in, as is often done. When inflammation is very acute, it is sometimes necessary for the surgeon to puncture the drum in its lower part.

ECZEMA OF THE EAR

Eczema of the ear, consisting of a cracked condition of the skin in the ear, with watery discharge and intense irritation, is com-

mon, as an acute affection, in infants, and as a chronic one in gouty and rheumatic adults.

Treatment.—In children, syringing with salt and water and application of vaseline, with care not to bring soap in contact with the ear for a time, affords relief. In adults, weak nitrate of mercury ointment, or tar ointment mixed with vaseline, applied with a brush several times daily, does good.

℞ One-per-cent. Ointment of Yellow Oxide of Mercury.

DIRECTIONS: Apply small amount to ear night and morning.

Or:

℞ Oil of Tar.....one teaspoonful
Oil of Camphor.....one ounce

Mix.

DIRECTIONS: Keep skin covered with this liquid.

FOREIGN BODIES IN THE EAR

Foreign bodies, such as peas, gravel, or slate-pencils, are often pushed by children into the ear, and are extremely difficult to remove.

Treatment.—An attempt should first of all be made by syringing as for wax. In the case of peas, however, it is better to syringe with warm oil, because water causes the dried pea to swell and block the passage still more. If syringing be ineffectual, no attempt should be made by unskilful persons with hair-pins, bent wires, or the like, to remove the object, which is often by these means pushed through the drum.

℞ Sweet-almond Oil .....one-half ounce

DIRECTIONS: Drop into the ear, until the foreign body can be removed.

MASTOIDITIS

Definition.—This is a serious complication of inflammation in the ear.

Causes.—As a rule, inflammation in this cavity arises by direct spread of a long-standing suppuration from the middle ear,

sometimes in consequence of neglect to keep the ear clean and prevent discharge from accumulating, though in influenza and some other conditions the mastoid antrum has been known to become primarily affected.

Symptoms.—The signs of this condition are rather vague, but include swelling and tenderness of the skin behind the ear, redness and swelling inside the ear, pain in the side of the head, feverishness, and discharge of foul-smelling, brownish material from the ear.

Treatment.—If the condition be left to itself it may, after a period of inflammation, resolve itself without the formation of an abscess, but the dangers are very great. More usually an abscess forms, and the pus, if unrelieved, bursts, according to the nature of the surrounding bone, upward or backward into the skull at the base of the brain, or outward through the skin, or downward among the muscles of the neck. Accordingly, in early cases, the surgeon applies a leech or makes an incision through the skin behind the ear to relieve congestion, but as soon as he is convinced that an abscess has formed, he chisels down through the bone of the mastoid process till he can clear out the pus, and completes his operation by making a free communication between the antrum and the ear, so that pus cannot collect again when the outside wound heals.

TINNITUS—RINGING IN THE EAR

Ringing in the ear is sometimes a very annoying symptom. It may take various forms, but is in general accompanied by catarrh of some part of the ear.

Treatment.—Clicking similar to the noise made by winding up a watch, and caused by spasm of small muscles about the throat and ear, is relieved by general tonic treatment. Pulsating or throbbing in the ear is sometimes due to bloodlessness, or to large doses of quinine or salicylate of soda, and passes off as the bloodlessness is treated or the drugs producing it are discontinued. Blowing, hissing, and whistling noises, like those made by an escape of steam, or by a boiling kettle, are the most common and most annoying forms. Usually they are associated with middle-ear catarrh, but they are very often due to gout or rheumatism, and diminish as this disease is treated. Accom-

panied by deafness, ringing is not infrequently due to wax. Blisters behind the ear, the passage of a galvanic current through the head, and inflation of the middle ear generally give only temporary relief from ringing. Bromide of potassium or dilute hydrobromic acid is the drug which is most often successful by internal administration. Musical tinnitus sometimes occurs, in which the sound of bells, or of short passages of music, is repeated constantly. It is due to similar causes.

℞ Bromide of Potassium.....two teaspoonfuls
Bromide of Sodium.....two teaspoonfuls
Chloroform-water .....three ounces
Mix.
Dose: One teaspoonful in a wineglass of water, every three hours until pain is relieved.

TUMORS IN THE EAR

Tumors in the ear are mostly either outgrowths from the surrounding bone or soft polypi. The former may block the passage and interfere with hearing, but have often a narrow neck, so that they can be easily removed. Polypi usually develop as a result of the irritation set up by a chronic discharge, and shrivel up as the discharge is cured, though a large one may have to be removed in order to get at the drum.

WAX IN THE EAR

Wax in the ear is the commonest cause of deafness, sometimes even of several years' standing. It is to be removed by syringing with warm water containing two teaspoonfuls of baking-soda to a glass of water. If the wax be very hard it should be softened by making the person lie down on his side for half an hour with the affected ear upward, into which is poured some of this solution, or a few drops of sweet-oil. At the end of half an hour the syringing is repeated.

℞ Camphorated Oil .....one-half ounce
Directions: Five drops in the ear, night and morning, until wax disappears.

Or:

℞ Table Salt.....one ounce
Powdered Borax.....two ounces
Mix.
Directions: One teaspoonful to a pint of water, and wash out the ear.

DISEASES OF THE EYE

BLEPHARITIS

Definition.—Blepharitis, or chronic inflammation of the margin of the lids, occurs in weakly children. It is known by a variety of names, and it may produce, if not treated, a red, watery condition of the eyelids, with loss of the eyelashes, known as blear eyes, which persists throughout life.

Cause.—Very often the onset follows one of the acute diseases of childhood, especially measles.

Symptoms.—It begins with swelling near the edge of the eyelid, usually the upper one, redness, and the constant formation of a crust round the roots of the eyelashes. The lower lid becomes infected later.

Treatment.—Remove the crusts from the lids twice a day with the following:

℞ Saturated Solution of Boracic Acid.....four fluid ounces
Use as directed, warm.

Dry carefully, and at once apply the following astringent and antiseptic:

℞ Ointment of Yellow Oxide of Mercury...one ounce
Directions: Apply to eyelids twice a day, after washing.

The treatment must be persevered with for weeks or even months to prevent a relapse; and it should be remembered, for the sake of other children, that the disease is infectious, and may be conveyed on towels, sponges, and handkerchiefs.

WOUNDS OF THE EYE

The eyebrows, cheek, nose, and even the eyelids are often wounded, but seldom the eye itself, on account of the efficient protection afforded to it by these parts. The danger of a wound to the eye consists, not so much in the wounding of any important structure, which will heal with great rapidity, as in the introduction of organisms which may set up inflammation. The most dangerous position for a wound is in the ciliary region, that is, just outside the margin of the cornea, from whence a destructive inflammation not only of the wounded eye, but also of the other, causing total blindness, is apt to be set up. Metallic particles which penetrate the eye should always, if possible, be removed, because the fluids of the eye act upon them to form irritating chemical compounds. Most eye hospitals are provided with a powerful electromagnet, which will draw small particles of iron or steel from the deeper part of the eye into the anterior chamber, where they can be seen by the operator and successfully removed. Cinders or dust may lodge behind one of the lids or may be embedded in the cornea and cause much pain. In this case the eye should not be rubbed, but a handkerchief may be gently pressed against it. The lids should be drawn gently apart, and if the body be seen it should be wiped off the eye with a wet camel's-hair brush or clean wet rag. If it cannot be seen the eyelids should be turned outward and the inner surface of each lid examined. The lower lid is simply pulled downward. To examine the upper lid, the person is told to look steadily downward, a flat pencil, or paper-knife, or penholder, is laid horizontally along the center of the lid, and the lid, being grasped by the eyelashes between the finger and thumb of the person who is looking for the foreign body, is gently and quite painlessly folded upward over the pencil, etc. The irritating body is then brushed away, and the lid turned down again. If a piece of lime has got upon the eye it should be sponged with vinegar and water, and if acid has got into the eye it should be copiously bathed with baking-soda in water.

A four-per-cent. solution of cocaine should be dropped into the eye before attempting to remove a foreign body.

SCLEROTITIS

Definition.—Sclerotitis, or "hot-eye," is a not uncommon trouble in persons who have a markedly gouty or rheumatic constitution.

Symptoms.—Inflammation of the sclerotic coat accompanied by patches of dusky redness over the white of the eye, pain, and watering of the eye.

Treatment.—The condition subsides when protective glasses are worn and the constitutional condition is treated; but it is very obstinate to cure and liable to recur.

CYSTS OF THE LIDS

Cysts of the lids often arise in connection with the Meibomian glands. They may last for many years, and give no trouble beyond that of irritation and disfigurement caused by their size, if they be large. They are removed, when desired, by an opening on the hinder surface of the lid, which is turned outward for the purpose. The contents being scraped out, the cyst does not tend to refill. This small operation is done under cocaine.

BLACK EYE

Black eye is an effusion of blood under the loose skin over and round the lids, due to a blow. Within the first few hours of a blow on the eye, much may be done to diminish the blackness by a pad of linen wrung out of cold water, and tightly bound on by a handkerchief passing round the head. After the first day absorption may be hastened by gentle massage.

ULCER OF THE CORNEA

Ulcer of the cornea arises from various causes, several of which have been mentioned. Two chief dangers attend an ulcer here, one being the fact that a white scar, which interferes with vision, especially if the ulcer has been on the center of the cornea, is almost certain to follow the ulcer; the other danger being that of perforation of the cornea (which is only about one millimeter in thickness), followed by more or less destruction of the eye.

Treatment.—The great essential is to keep the eye clean. Hence bandages, poultices, and such applications are in most cases likely to be harmful. The following has rendered good results:

℞ Iodoform ..... twenty grains
Vaseline ..... one ounce
Mix.
Directions: Apply to the eyelids and over the surface of the eye.

Atropine is used to combat the iritis which always attends severe ulceration of the cornea. If the ulcer is spreading, the method generally adopted to check it is the use of the actual cautery applied at a dull red heat to the spreading margin. Another effectual way is to pass a fine knife through the anterior chamber in such a way as to divide the ulcer and freely open the anterior chamber. It has always to be borne in mind that a corneal ulcer of the severe spreading kind may, if not checked, destroy the cornea in a few days, and with it all hope of useful vision in that eye. Hence the necessity for prompt and efficient treatment.

KERATITIS

Definition.—Keratitis is an inflammation of the cornea. The most important form is that known as interstitial keratitis, so called because it is an inflammation of the substance, not of the surface, of the cornea.

Causes.—It is very often the result of inherited syphilis, and comes on in childhood between the ages of five and fifteen years, but it may be also due to exposure, in the case of young persons of weak constitution.

Symptoms.—The cornea gets dull and hazy, the sight being a good deal interfered with, and at the same time there are pain and intolerance of light. This disorder lasts usually two or three months, or longer, both eyes being affected, and it is almost always accompanied by iritis, which renders it still more serious.

Treatment.—The treatment generally adopted is the use of atropine drops and the wearing of dark glasses. Special attention is paid to improving the constitution, and mercurial preparations are commonly administered. The chief danger of the

disorder is that it leaves behind it opaque patches in the cornea, which interfere with vision or even obscure it altogether.

RETINITIS

Definition.—This is an inflammation of the retina, the innermost coat of the eye, in which the nerves of the eye are distributed. Seldom does it occur alone, as it always means an involvement of the circulatory or nervous system.

Causes.—It is a condition associated with Bright's disease, and also found with specific diseases, as syphilis. The basis of this condition is a weakening of the walls of the blood-vessels, resulting in hemorrhages around the ends of the nerves. The affection is nearly always present in the aged who are troubled with hardened and shrunken kidneys.

Treatment.—The causative factor of the disease should be found and treatment directed toward the cause. If there is no evident systemic disease, a physcian should be consulted. During the beginning of the affection the eyes should be kept at rest. No reading should be done, and, if necessary, the eyes should be covered with a green shield.

CONJUNCTIVITIS

Definition.—Conjunctivitis, or inflammation of the conjunctiva, is a very common eye affection. Not in itself a serious condition, it may yet rise to grave complications, as, for instance, ulceration of the cornea.

Causes.—A chronic state of redness or congestion of the eye, hardly amounting to conjunctivitis, is common in people whose eyes are much exposed to irritation from dust, smoke, cold winds, etc. In gouty or plethoric people a similar congested state of the conjunctivæ is often met with. Even the strain upon the eyesight due to errors of refraction may cause the eyes to appear reddened and tender. Cold in the head is very often associated with congestion of the conjunctiva, or even with a conjunctivitis more or less severe. In some infectious diseases, and notably in measles, conjunctivitis is a well recognized symptom. Recent bacteriological investigations have shown conclusively that microörganisms are the cause of nearly all cases of acute

and subacute conjunctivitis. This explains why epidemics of conjunctivitis often occur in schools, orphanages, and similar institutions, the infection being readily conveyed on towels, sponges, etc., from one person to another.

Symptoms.—The most characteristic sign of conjunctivitis is that the affected eye becomes red or *bloodshot*. This is due to the dilatation of the numerous vessels which ramify over the conjunctival surface. The color is often described as brick red, and it is specially to be noted that the redness is general, and not most marked round the cornea, as is the case in iritis. The *swelling* of the conjunctiva in severe cases may be very marked, and a thickened fold may form round the edge of the cornea. Hemorrhages in the conjunctiva from rupture of small blood-vessels are very frequently seen in acute cases, but their presence does not afford any special cause for anxiety. Subjective symptoms vary greatly in severity. In mild cases there may be merely an annoying feeling of roughness or sand in the eye, while in severe cases there may be very great *pain*. *Photophobia* (dread of light) is a constant symptom, but is not usually so intense as in iritis and keratitis.

The *discharge* from the eyes in the early stages is thin and serous, but assumes more or less the character of pus after a few days. The sticky secretions tend to keep the lids gummed together, so that there may be great difficulty in opening the eyes, especially in the morning. Both eyes are usually affected, but very often the disease begins in one eye some days before it attacks the other; the second eye in such cases becoming infected by accidental contamination with discharges from the inflamed eye. An attack of acute conjunctivitis lasts from one to two weeks.

Treatment.—In simple cases all that is needed is to keep the eyes clean by frequent bathing with a mild antiseptic lotion, such as boracic acid lotion.

Or:

℞ Protargol Solution, five per cent.

Or:

℞ Argyrol Solution, twenty per cent.

The bathing is best done by pledgets of absorbent cotton, which can be burned after use. A mild antiseptic ointment, as boracic

or zinc ointment, should be smeared on the lid margins to prevent gumming of the lids.

Or:

℞ Yellow Oxide of Mercury.....two grains
Vaseline .....two drams
Mix.
Directions: Apply to lids at night.

GLAUCOMA

Definition.—Glaucoma is a disease of the eye, occurring most commonly after the age of fifty years, in which this organ becomes increasingly distended with fluid till its use is destroyed.

Causes.—The disease occurs in elderly people, particularly in those who possess small eyeballs, and it is said that an attack often follows upon great anxiety or sorrow. The manner in which it arises is as follows: A sharp angle exists all round the ring of junction between the iris and cornea, and in this angle the fluids of the eye filter out and into the blood-vessels situated in the neighboring ciliary body. Sometimes in old age, owing to increasing size of the lens or to some inflammatory change in the eye, the iris becomes pushed forward at its outer margin against the cornea, and thus the angle where filtration occurs is shut up. Accordingly fluid collects in the hinder part of the ball, its coat becomes stretched, and inflammation sets in.

Symptoms.—Very often glaucoma appears so slowly, and with so little pain, that the condition is far advanced before it attracts special attention, but sometimes a series of well marked acute attacks gives warning that a serious condition is present and allows it to be averted or lessened by early treatment. An acute attack usually begins at night with great pain in one eye, shooting through one side of the head, and this pain may be so severe as to produce sickness and vomiting at first. Colored halos are seen round lamps and candles, and there are various other peculiarities of vision. The veins on the surface of the eye are distended, giving it a bloodshot appearance, and the pupil is often wide and oval in shape instead of small and round like that of the sound eye. The peculiar gray-green haze, which gives the disease its name, may or may not take the place of the absolute blackness shown by the healthy pupil. When the eye

is closely examined by a specialist, the tension of the ball is found to be increased, so that the eye is harder than usual; the anterior chamber lying between iris and cornea is shallow, and both the latter appear hazy; the field of vision is much restricted; and on examination with the opthalmoscope the optic disk is found to be deeply indented or cupped, if the disease has been present any length of time. The severe pain may last for two or three days, gradually decreasing, but if the condition be not recognized and treated, it reappears in a few weeks. Attacks become more and more frequent as time goes on, and the vision gets steadily worse, finally an ulcerative condition appears.

Treatment.—Prior to 1857 the disease was incurable, but in that year Von Graefe introduced the operation of iridectomy for glaucoma. This operation is performed by making an incision into the anterior chamber of the eye along the line where the cornea merges into the sclerotic, grasping the iris, and, partly by cutting, partly by pulling, removing a segment of it, so as to free the angle of filtration at one point. A more modern operation is that of sclerotomy, in which a wide incision is made in the same situation as for iridectomy, or a small circle bored out of the sclerotic coat, but no part of the iris removed.

When the condition is very slowly progressing, or when, for any reason, operation is inadvisable, a solution containing one half per cent (2 grains to the ounce) of Eserine in sterile water is dropped into the eye night and morning, and since this drug powerfully contracts the pupil, the iris is drawn away from the cornea and the angle between them opened up for filtration.

Caution:—In dealing with a matter of so great an importance as the "Eye" and its vision, remedies of so delicate a nature should not be employed without the advice of a physician.

CATARACT

Definition.—Cataract is an opacity of the crystalline lens of the eye more or less completely obscuring vision.

Causes and Varieties.—The most common form is *senile cataract*, which begins about the age of fifty in eyes which may have been perfectly healthy. Contrary to what is generally supposed, heredity has very little to do with its causation. In every eye the lens from childhood onward slowly hardens and loses

its power of focussing for near objects, and in the cataractous eye there is a special hardening and rapid shrinkage at the center of the lens, which leads to splitting up and gradual disintegration of the lens, with consequent loss of transparency. Senile cataract, then, has nothing to do with loss of general health, or with disease of the rest of the eye. *Cataract in children* may be found at birth, and there may or may not be other disease of the eye, so that the result of operation is not so promising. *Diabetic cataract* appears sometimes in persons suffering from diabetes. It is quite an ordinary cataract, and yields good results on operation, but, like all operations on diabetic persons, the operation for its cure has risks of its own. *Black cataract* is one in which the lens is black in color from blood pigment. The result of operation is unpromising, because there is often disease of other parts of the eye which has destroyed vision. *Partial cataracts* of various forms occur, obscuring vision in one direction but not requiring operation. *Posterior polar cataract* is one at the back of the lens, and is a rare form which is important because it follows disease in the back of the eye, and, though there is impairment of vision, this is not due to the cataract nor cured by its removal. It comes on in fairly young persons. *Cataract from injury* is caused by almost any wound of the lens, and sometimes by severe blows on the eye.

Symptoms.—The first thing noticed is motes in the vision, not floating, like those seen by almost every healthy eye against white background, but stationary.

Bright objects are seen multiplied, especially bright lights at a distance in the dark. A moderate degree of short-sightedness may come on, which is relieved for a time by spectacles. Gradually increasing blindness is the most apparent symptom, and in the early stages the person may be less blind in the dusk than in bright light, because, the center only of the lens being affected, a clear part round the edge admits the rays of light when the pupil, i.e., the opening in the iris, dilates, as it does in dull light.

Finally, when the cataract is well advanced, it becomes visible to bystanders as a ground-glass-like mass filling up the pupil.

Treatment.—No medicines or eye-washes or ointments are of any use against cataract. Atropine drops, which dilate the

pupil, are much resorted to by quacks, because their use is followed for a time by better vision. The cataract is unaffected by such applications, and can be removed only by operation. A delay of months or years must often take place after sight begins to fail before the cataract is ripe, i.e., before the lens is hardened throughout sufficiently to be completely removed, though many cataracts in old people admit of successful removal by operation even when they are unripe. In all cases the eyes may be freely used so long as it is possible to do so. There is a great variety of operations, but the chief are: (*a*) *extraction* of the lens by a broad opening made near the edge of the clear cornea, removal of a piece of the iris, and finally opening of the capsule of the lens, which is then gently squeezed out; and (*b*) *discission* or tearing of the capsule of the lens by a needle or needles passed through the cornea, so as to admit the fluid which is found in the front part of the eye, filling the space between the cornea and lens, and which dissolves the lens when admitted into its substance. Extraction is done in the great majority of cases; discission is suitable only for the soft cataracts of young persons. The operation is usually done without chloroform, and is very safe and successful even in very old persons, though demanding great skill. After removal of the lens, at least two pairs of spectacles must be used, one for distant vision, and one for reading.

Sometimes after an operation for cataract disappointment is experienced because the sight is not restored. In such cases the retina also is diseased, and though the removal of the cataract admits light to the eye, the defective retina is unable to perceive objects clearly. To avoid this the eyes should be carefully examined by an expert before the cataract becomes sufficiently dense to obscure the back of the eye.

IRITIS

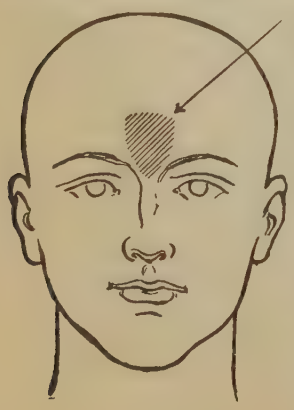
Definition.—Iritis, or inflammation of the iris, is very closely associated both in cause and in symptoms with inflammation in the ciliary body and choroid membrane, which together with the iris make up the middle coat of the eyeball.

Varieties and Causes.—Attacks of iritis differ mostly in severity or in the absence of one or more of the usual symptoms,

for, whatever be the cause, the resulting disease has much the same appearance. It is not a common condition in young children, and, when it occurs in them, is associated generally with ulcers of the cornea. Most of the cases are found among boys and girls in their teens, or in adults, and about half of all such cases are due to syphilis, very often of an inherited type. Indeed, iritis, accompanied by inflammation of the cornea or of the choroid coat, is the usual cause of the serious impairment in vision which is apt to ensue from this disease. Rheumatism forms the cause in the majority of the remaining cases, though the disease, in occasional instances, appears during the course of fevers and in persons suffering from diabetes.

An important form of inflammation of the eye commencing in the iris and ciliary body of one eye, as the result of a wound received by the other eye, is known as sympathetic iritis. This form of inflammation seldom starts save as the result of an open wound in the ciliary region, or of one caused by a foreign body which enters and remains in the eye. Formerly it was supposed that the damaged eye exerted upon the other one an irritating influence through their nervous connections; now, it is generally held that the inflammation is due to organisms which enter by the wound, cause inflammation of the damaged eye, and then infect the other eye either by the lymph spaces which connect the two, or indirectly through the blood. For this reason all eyes that have received severe penetrating wounds, and that are sightless, inflamed, and painful, should be removed to avoid the risk of sympathetic trouble in the sound eye.

Symptoms.—The most marked symptom is pain situated either in the eye itself or more commonly in the spot indicated



by the shaded area in the accompanying illustration. There may be much watering of the eye, and bright light always occasions more or less distress. The eye is red around the margin of the iris, and for this reason the condition is often taken for inflammation of the conjunctiva covering the eye—a much more trivial condition. Dimness of vision is usually present, and, particularly in rheumatic cases, may for long be the only sign. When one looks at the

eye closely, one notices that the iris has lost its luster, and the pupil is generally narrow. If the affected person has suffered previously from iritis, the iris may be adherent behind to the lens of the eye, so that the pupil loses its usual circular outline, and ceases to vary in size in different lights. An acute attack of iritis generally lasts some weeks even when treated, and if the condition be not carefully treated, the sight may be much impaired or lost as the result of opacities in the lens or cornea, deposit of inflammatory matter in the pupil, and the like.

Treatment.—Rest of the eye is of the highest importance. To effect this, all reading and other near work, even with the unaffected eye, must be given up. To prevent the eye from being used, the following solution should be dropped into it:

℞ Atropine ..... two grains
Water ..... one fluid ounce
Mix.
DIRECTIONS: One drop in the eye.

As a still further protection, dark glasses should be worn. Sometimes a blister or a leech applied to the temple affords relief from the pain. The general disease which is responsible for the iritis should at the same time be treated by general remedies.

SQUINTING

Definition.—Squinting is a condition in which the two eyes do not look in the same direction at one time. The movements of the eyeballs depend upon the action of six muscles, four being straight and two oblique. Of these muscles the outer and inner straight (*recti*) muscles turn the eye from side to side and enable the two eyes to act together. The external rectus muscle and the internal rectus muscle are therefore the most important of the six, and defects connected with them produce inward or outward squint. Other squints upward or downward are occasionally, though only rarely, met with, and will not be further referred to.

Causes.—A squint which appears in early childhood is very often due to some optical error in the eye, generally in the direction of *long-sightedness*. Such a defect causes squinting

inward of one or both eyes, especially when the child looks at something close at hand. The reason for this is that the person with the long-sighted (hypermetropic) eye makes an excessive effort in accommodating his vision for near objects. The muscle of accommodation is supplied by the same nerve (third cranial) as the internal rectus muscle, and the excessive effort is apt therefore to overflow into the muscle which pulls the eye inward. The two eyes when thus directed across each other cannot act together, and the person therefore uses only one at a time, directing it straight forward and turning the other still farther inward. If the eyes are equally good, the person adopts a habit of looking straight forward first with one eye, then with the other, and is said to have an alternating squint. If, however, the refractive error in one eye be much greater than that in the other, the better eye is always used, and the squint in the other becomes a permanent squint. The power of vision may be so little exercised in a permanently squinting eye that even at an early age it may be almost lost, though the person is unaware of the fact till careful examination reveals it.

Short-sight is also productive of an inward squint in persons who are not provided with proper spectacles. In reading, writing, and other near work such people bring their work much closer to the eyes than is natural, and the internal recti muscles of the two eyes get a disproportionate amount of work in constantly making the eyes converge. These muscles increase in power, therefore, and produce the permanent degree of convergence which is frequently seen in short-sighted students.

Defective vision in one eye is another, though much less frequent, cause of squinting. That is to say, there is, quite apart from mere refractive errors which can be corrected by spectacles, some defect in the power of seeing. In such a case, the defective eye is not controlled by its muscles, and has a great tendency to roll outward at times.

Paralysis caused by some affection of the brain or of the nerves supplying the eye muscles is the usual cause of a squint which suddenly appears after the person has passed the years of childhood. The sixth nerve, which has a long course over the base of the skull and supplies the external rectus muscle, is specially liable to suffer in this way. This produces a strong

inward squint of one eye, when the glance is directed toward the side to which the eye belongs, since the eye cannot be turned outward.

Treatment.—It is highly important that children who show a squint should have the eyes examined, for, as already stated, the great cause is an error of refraction remediable by glasses. So long as the child can look at things with either eye, there is no call for immediate treatment, but if the squint becomes limited to one eye permanently, that eye will deteriorate in power of vision. The squint can often be remedied by glasses, but if it has lasted a long time, it is generally necessary to perform an operation for the division or shortening of one of the muscles. This operation is very slight and almost painless, but it requires great nicety of judgment and execution. In squint due to short-sight, the treatment is similar, consisting of the use of proper spectacles in the early stages or of a small operation later on.

Squint due to paralysis of the sixth nerve requires general medicinal treatment, not an application to the eyes.

WATERY EYE—EPIPHORA

Definition.—Watery eye, in which the tears overflow on to the face, is also a slight but very annoying trouble.

Causes.—It results from some interference with the ducts which should convey the tears away to the lower part of the nose. Sometimes in old people with flabby eyelids, or in cases where there is a contracting scar on the face, the lower eyelid turns outward so that the lachrymal punctum is drawn away from the eye and the tears cannot enter it, but collect in the hollow of the lid and then run over the face. Usually there is a blockage, it may be of the canaliculus by an eyelash or other small object, or, more often, of the duct upon the side of the nose as a result of inflammation. In the latter case a small swelling forms upon the side of the nose, and if one presses upon this with the finger, tears and mucus ooze back on to the eyeball. If this condition be permitted to continue, not only is there the annoyance of tears constantly trickling down the cheek, but suppuration is very apt to occur in the obstructed duct and to produce a small but unsightly sinus on the side of the nose, which can

hardly be made to close. The presence of a suppurating tear-sac is a source of great danger to the eye, because, after any accident to or operation on the eye, virulent organisms are apt to spread from the sac and set up ulceration of the cornea.

Treatment.—Where the cause is due to conjunctival irritation, a mild astringent lotion may be employed.

℞ Zinc Sulphate.....two grains
Water .....one fluid ounce
Mix.

Foreign bodies blocking the lachrymal puncta or canaliculi must be removed. If the lower lid is turned outward so that the lower punctum does not touch the eyeball, this punctum and canaliculus should be slit up with a fine probe-pointed knife. When the lachrymal sac is distended with mucus and pus the canaliculus should be slit, and a large probe passed down the nasal duct into the nose, so as to remove any obstruction and allow free drainage into the nose. Gentle washing out of the sac with a small syringe often helps to restore the parts to a more healthy state, using boracic acid solution. In very bad cases many surgeons advocate removal of the lachrymal sac by operation.

NYSTAGMUS—TWITCHING OF THE EYES

Nystagmus, or twitching of the eyes, is a symptom of many nervous disorders, but, being due to a want of control of the nervous system over the action of the muscles which move the eyeball, is not really an eye disorder. It is very frequently observed also in persons who have had bad eyesight from childhood, and in miners.

STY

Sty is one of the best known of eye affections, and consists of an inflammation situated round an eyelash. It begins as a general swelling of the lid accompanied by pain, and gradually suppurates. Very often as one sty subsides another appears. Usually some constitutional weakness is present, and not infrequently the person suffers from habitual constipation.

Treatment.—Poultices relieve pain and hasten suppuration, otherwise sties are to be treated like boils.

DISEASES OF THE MOUTH, THROAT, AND NOSE

ULCERS OF THE MOUTH

THESE are usually of small size, and arise from a variety of causes. It is not at all uncommon in feeble, badly fed children for one or two ulcers to develop on the inside of the cheeks, on the gums, or on the tongue, causing pain in eating, profuse discharge of saliva, and offensive breath. These ulcers generally heal when the child is well fed and a mouth-wash of chlorate of potash is frequently used, but they may pass on to the serious condition of cancrum oris, or gangrenous sore mouth. Single small ulcers arise in quite healthy people from the irritation of a jagged tooth, a small wound, or even apparently as the result of dyspepsia. These may be very troublesome, and being generally situated in the groove between lip and gum, or on the tip and edge of the tongue, they are prevented from healing by the movement of the parts, and may become very troublesome for weeks or even months. A small ulcer is frequently developed beneath the tongue during the course of whooping-cough, as the result of friction against the lower teeth in coughing, and is prevented from healing by the same cause. Ulcers may also be of tubercular or syphilitic origin, the latter being a very frequent cause.

Treatment.—The digestion must receive careful attention, the mouth must be kept clean by antiseptic washes and regular brushing of the teeth, and the little ulcer may be touched with a strong astringent every few days, and, in the interval, protected by occasional application of borax-honey or glycerinite of boric acid. The bowels should be kept open by the use of mild laxatives. It is generally well to begin with a dose of rhubarb and magnesia.

Antiseptic washes should be used freely, as:

℞ Tincture of Iodine.....six drops
Directions: Add to one glass of hot water and wash mouth out well every two hours.

Or:

℞ Glycothymoline and water..... equal parts

Or:

℞ Salt .....one-quarter teaspoonful
Directions: Add to half a glass of hot water, and use as a mouth-wash.

INFLAMMATION OF THE MOUTH

This condition arises from the same causes as inflammation elsewhere, but among the special causes may be noted a jagged or painful tooth, an ill-fitting plate, the cutting of teeth in children, alcohol, tobacco-smoking, digestive disturbance, and, in the special form of inflammation known as thrush, a parasitic mold. General ill health plays a very important part in the case both of children and of adults. Whatever be the cause, the mucous membrane becomes red, swollen, and tender, while small ulcers may in some cases develop here and there. Generally, the avoidance of highly spiced food, of alcohol, and of tobacco is sufficient to cure the condition, which may be soothed, while it lasts, by smearing on glycerinite of boric acid, or honey of borax.

TUMORS OF THE MOUTH

Tumors occur on the lips, on the alveolus bearing the teeth, arising either from the gums or bone, and most commonly on the tongue. Those which develop in the gum or bone beneath it go by the general name of epulis, whatever be their nature. Occasionally these are malignant, more often they are simple fibroid tumors, produced frequently by the irritation of decaying teeth. On extraction of the associated tooth or teeth and removal of the epulis it seldom gives any more trouble.

Growths upon the lips and tongue may be simple warts, or cysts may occasionally be found, but by far the commonest tumor of these parts is cancer. It seldom appears before the age of forty, and seems in many cases to arise as the result of

long-standing irritation by a jagged tooth, smoking, or a chronic ulcer. The glands on the front and sides of the neck become early the seat of secondary malignant growths, and as the foul state of the interior of the mouth, after such a tumor ulcerates, causes much interference with the general health, the duration of life is not long, being placed by authorities upon the subject at little over a year after the tumor first appears. By modern surgical treatment, which aims at very free removal of the diseased part of the tongue and glands, life is prolonged, particularly in cases subjected to early operation, considerably beyond this period. The result of removal causes little or no disfigurement, and when a portion of the tongue is removed the power of speech is often but little impaired.

GUM-BOIL

Definition.—Gum-boil is a condition of inflammation, ending generally in abscess, situated about the root of a decayed tooth.

Causes.—The gum-boil results often from a chill, or may appear beside a tooth which has been long in a decayed condition, at a time when the general health is below par.

Symptoms.—One tooth becomes a little painful and seems a little raised above the others, but the pain is at first relieved by clenching the teeth tightly, though after a day or more the affected tooth becomes extremely tender. A thickening forms at the side of the tooth, which is also at first relieved by pressure, as by holding a pad of absorbent cotton, or a fig, or similar soft mass between gum and cheek. After two or three days the pain lessens, and either the swelling gradually subsides or an abscess forms and bursts, generally between gum and cheek, but, it may be, on the cheek.

Treatment.—If there be any cavity in the tooth it should be stopped with absorbent cotton soaked in pure carbolic acid, and if the pain and swelling do not speedily abate, the tooth should be pulled. If the swelling be considerable, immediate relief is often gained when the gum is scarified down to the bone on the outer side between gum and cheek. If the skin is getting red over the swelling, this should be done as soon as possible, for, otherwise, the abscess is likely to burst through the cheek, leaving an unsightly scar.

SALIVARY CALCULUS

Salivary calculus, or stone in the salivary glands or ducts, is a condition that may give rise to a good deal of trouble. The stone, if it lodges in one of the salivary ducts, may ulcerate out on the face, and then causes a fistula, from which saliva constantly trickles over the cheek. A fistula may be produced also by wounds of the cheek, involving the duct of the parotid gland. These fistulæ are cured by a slight operation, which reopens a passage to the mouth and closes that upon the cheek.

SORDES

Definition.—Sordes is the name applied to the thick offensive material which gathers on the lips, teeth, and tongue of persons who are very weak from fever or other cause. The constant movements of the tongue and lips in healthy people serve to keep them free of growing bacteria, remnants of food, and cells cast off from the mucous membrane of the mouth, which in the enfeebled state collect and form a brown or black putrefying deposit.

Treatment.—The lips, tongue, and teeth should be wiped occasionally with a rag dipped in borax and honey or glycerite of borax, and the rag then burned; or if the person be strong enough, he may rinse his mouth with a weak solution of permanganate of potassium in water, diluted to a pale pink color.

The following antiseptic solutions should be used freely after swabbing out the mouth with the glycerite of borax:

℞ Tincture of Iodine.....six drops
Directions: Add to one glass of hot water and rinse the mouth out every two or three hours.

Or:

℞ Glycothymoline and water.....equal parts

Or:

℞ Salt.....one-quarter teaspoonful
Directions: Add to half a glass of hot water and use as a mouth-wash.

CLEFT PALATE

Definition.—This is a deformity of the palate. It is usually congenital, although a child may acquire it after birth. It is an incomplete union of the palate, and may be partial or complete, that is, involving both the hard and soft palate. In cases where the separation is complete, it is usually accompanied by a harelip. A number of cases have been traced to syphilis of the parents.

Normally, these parts join during the third month of embryonic life, and if this is delayed the child is born with a deformed roof to the mouth. In many cases there is no roof to the mouth, with the result that the interior of the nose and the bones of the skull are exposed. Whether the cleft is congenital or accidental, the sufferer is unable to speak clearly or distinctly, and in some cases speech is utterly impossible. When a child so afflicted eats, some of the food is forced up into the nose, causing great inconvenience and suffering.

Treatment.—This deformity is apt to seriously interfere with speech and should be operated on by the surgeon. The operation is similar to that for harelip, but should not be done until after a few months, unless it is a very serious case. Where syphilis is the cause of the disease, there is not such a great opportunity for surgical treatment; the use of the artificial plate is the best. Modern dentistry has perfected an artificial plate to take the place of the roof of the mouth. This is held in place by attachment to the teeth, but of course this path is open only when the teeth have matured. In this latter treatment the child must be taught how to speak, which is a difficult task.

The operative treatment for this condition consists in dividing the mucous membranes at the sides of the upper jaw and joining them together in an attempt to form a roof for the mouth.

CHOKING

Definition.—Choking is the process which results from an obstruction to breathing situated in the larynx.

Causes.—It may occur as the result of disease causing swelling round the glottis (the entrance to the larynx), or interfering with

the regulation of the muscles which open and shut the larynx, but generally it is due to the irritation of a piece of food or other substance introduced by the mouth, which provokes coughing but only partly interferes with breathing.

Treatment.—If coughing be vigorous the choking person should be let alone, a glass of water being put within his reach, because a gulp of cold water often dislodges the particle, and, at all events, stimulates more vigorous coughing. The choking person should take slow, deep inspirations, which do not force the particle farther in (as sudden catchings of the breath between the coughs do), and which produce more powerful coughs. If the coughing be weak, one or two strong blows with the palm of the hand over either shoulder-blade, timed to coincide with coughs, aid the effect of the coughing. Finally, if the coughing be getting weak, lividity of the face and finger-nails coming on, and especially if unconsciousness have supervened, death is imminent within a few minutes unless the obstruction be removed. For this purpose the bystander should pass his right forefinger along the side of the patient's tongue, forcing the teeth apart first, if necessary, with a knife-handle, and keeping them apart by the fingers of the other hand with a napkin rolled round them. The forefinger should be passed as far down the throat as possible, its point then turned toward the middle line and hooked forward toward the root of the tongue. After a few attempts the foreign body will very likely be dislodged and pulled up into the mouth.

OFFENSIVE BREATH

This is sometimes extremely unpleasant to those around the subject of the trouble, though the smell may be extremely foul without the person himself being conscious of it.

Causes.—Frequent causes are bad teeth, chronic tonsilitis, constipation, and indigestion. Besides these an excessively fetid condition is caused by bronchiectasis, by ulceration about the bones of the nose, and by a peculiar disease of the nose, known as ozena, in which smelling-crusts constantly form there.

Treatment.—Bad teeth should be filled or pulled, and the spaces between the teeth kept clean by brushing after each meal.

Constipation is a very common cause, gases from putrefaction of food in the intestine being absorbed into the blood and excreted by the lungs. In one form of tonsilitis, small cheesy pellets of secretion collect in the crypts of the tonsils and putrefy; the tendency to this is lessened by removing the tonsils, or by using daily some solvent or antiseptic gargle. Indigestion is also credited with being a frequent cause of bad breath. The smell may be temporarily relieved by occasionally placing a small drop of some essential oil, such as cloves, on the tongue, or by various scented sweets.

DISEASES OF THE TEETH

Causes.—All diseases of the teeth are due to decay except when the condition occurs as a congenital deformity. The technical name for decay of the teeth is "caries." There are many different forms of this condition, and the resultant diseases depend on the factors causing it. Decay of the teeth is becoming extremely common, and it seems to be related to an increased variety of diet, particularly in the greater use of soft articles of food. The mechanical action of chewing, combined with the increased flow of saliva which it produces, effectively removes all trace of food from the surface of the teeth and from the spaces between them. Among the civilized races, where a great part of the food is fine in quality, thoroughly cooked, and soft in consistence, the necessity for chewing is not present and the art of proper mastication tends to be lost.

The result of this is that food particles on and between the teeth are not dissipated, and the germs which are constantly present in the mouth set up fermentation in them, with the formation of acids which dissolve the lime of the teeth and so produce decay. It will be obvious, from the reasons given, that decay will occur more easily in teeth which are widely separated, owing to the greater ease with which food particles remain between them; also in such disease as rickets, where the amount of lime in the teeth is deficient.

When the teeth are allowed to become decayed, the food cannot be chewed properly, and this, in its turn, is one of the commonest causes of indigestion. The individual is being constantly

poisoned by the absorption of poisonous material, and a state of more or less chronic ill health is frequently the result.

In many cases anemia of the most severe kind is directly attributable to the long-continued presence of decayed teeth.

Treatment.—The treatment should be a matter of prevention rather than cure. This should begin away back in childhood, when the child gets its milk-teeth. The teeth should, properly speaking, be cleaned after each meal and once again, even more thoroughly, before going to bed, because if any material is left among the teeth at this time, there is the entire night for fermentation processes to go on and to start decay.

RIGGS'S DISEASE—PYORRHEA—ALVEOLARIS

Definition.—This is a condition affecting the teeth and gums, in which the teeth tend to get somewhat loose in their sockets and there is a constant pouring out of purulent matter from between the teeth and gums. This condition gives serious results and should be treated by a physician or dentist.

Cause.—The cause of the disease is not definitely known. In years past it was thought to be caused by the collection of large amounts of tartar around the base of the teeth. If tartar is allowed to deposit on the teeth, it gradually increases and so acts as a foreign body. This causes inflammation of the gum, with the beginning of an ulcer, which makes an excellent place for germs to develop.

Symptoms.—This disease is more common than the general public surmise, and it is especially serious because of the large quantities of poisonous pus involuntarily swallowed by the sufferer. The disease is first noticed at the margin of the gums, which normally fit very closely around the neck of the teeth. In this condition the gums fall away from the teeth. In the very early stages blood and pus may be squeezed from the intervening space, if firm pressure be made. This space is gradually seen to grow deeper, finally extending to the root of the teeth. The condition may be localized to one tooth, or, as generally occurs, the surrounding teeth are involved.

Treatment.—This resolves itself into thorough cleaning of the teeth and frequent massage of the gums. This destroys the

germs and produces a normal circulation of the blood. The following mouth-washes are antiseptice and astringent:

℞ Borax .....one teaspoonful
Bicarbonate of Soda.....one teaspoonful
Glycerine .....two tablespoonfuls
Water .....two ounces
Mix.
DIRECTIONS: Use as a mouth-wash every three hours.

Or:

℞ Tincture of Iodine.....one teaspoonful
Glycerine .....one ounce
Dobell's Solution .....four ounces
Mix.
DIRECTIONS: Dilute with equal parts of water, and use as a mouth-wash before and after each meal.

HEMORRHAGE OF THE TEETH

Cause.—When a tooth is extracted, there is always a certain amount of hemorrhage, or flowing of blood. Normally, this bleeding will stop of itself, but when it continues after one hour there is some pathological condition. This is a secondary hemorrhage, and may continue for several hours. It is usually due to a lack of coagulation or thickening quality in the blood, or there may be hereditary tendency to hemorrhage.

Treatment.—The patient should be placed in a reclining position with the head raised. Apply hot-water bags to the feet to draw the blood from the head. Thoroughly wash the mouth and cavity with lukewarm water and then force into the cavity a firm plug of absorbent cotton; take a piece of cork of suitable size, cut a notch in it and place astride the gum over the cotton plug; close the mouth firmly upon it, and then bandage the jaw to keep the mouth tightly closed.

If the bleeding is very severe in the beginning, it is advisable to hold some astringent wash in the mouth, such as tincture of myrrh, using a teaspoonful in a wineglass of warm water.

If the above means do not stop the bleeding, saturate a piece of cotton with Monsel's solution and place this over the cavity.

NEURALGIA OF THE TEETH

Definition.—This is an inflammation of the nerves located in the jaw. It frequently results when the teeth are perfectly sound.

Cause.—The common cause of neuralgia is directly due to diseases of the teeth, because there is a close anatomical relation between the nerves of the face and those of the teeth. If the cause can be located in some bad tooth, it should immediately be treated by the dentist. This condition commonly occurs in teeth that have been filled months previously and yet appear to be sound. If this painful condition exists without any apparent cause, the question of bad teeth should be carefully considered.

Treatment.—Relief is often obtained by the application of hot-water bags to the side of the face. At night the jaw should be wrapped in a warm flannel bandage. The following may be given internally:

℞ Phenacetine .....five-grain tablets
Dose: One tablet every four hours for three doses.

Or:

℞ Migraine .....five-grain tablets
Dose: One tablet every three hours.

SORENESS FROM ARTIFICIAL TEETH

Definition.—When the artificial plate is first used in the mouth, there is a great tendency for the gums to become tender and swollen. This may be due to an irregularity in the plate, but is more commonly caused by the recent extraction of the teeth; also the mouth must be allowed time to accustom itself to the outline of the artificial contrivance.

Definition.—The plate should be removed from the mouth between meal-times for several days, to permit the mouth to resume its normal condition. This should not be resorted to in every case, because there is always a little discomfort when the plate is first used, and the retention of the teeth in the mouth is the best means of relieving the pain. When there is real soreness located in one portion of the mouth, an antiseptic mouth-wash-

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DISEASES OF THE TEETH

The large center illustration shows the teeth in their natural state of preservation, both the upper and lower jaws. It also shows how they are held in place, and nourished.

FIG. 1—Suppurating Pulp—Causing a pus sac to form at the root.

FIG. 2—Exostosis—Enlarged root due to chronic inflammation of the pulp.

FIG. 3—Periostitis—Inflammation of the Periosteum, without pus.

FIG. 4—Granuloma—Jagged and decayed surroundings causing irritation.

FIG. 5—Root Absorption—Caused by the chronic caries, that is, caries of dead teeth.

FIG. 6—Alveolar Abscess—Swelling of the tissues of the gum.

FIG. 7—Tooth showing dead pulp—This condition may create gas in the Tissue, and infection is often carried to the end of the root.

FIG. 8—Approximal—Cavity in molar tooth prior to any disturbance in the dentine.

FIG. 9—Infected Dentine—Caused by deep-seated cavities.

FIG. 10—Imperfect Calcification of Enamel—This affords a poor protection to the pulp, which causes inflammation and neuralgia.

FIG. 11—Pitted Enamel—This condition is usually caused by sickness at time of cutting teeth.

FIG. 12—Exposed neck of tooth—Caused by acid and the chief cause of neuralgia.

FIG. 13—Syphilitic Tooth, showing jagged and pointed edges.

FIG. 14—Erosion—Iron solutions causing disintegration of enamel salts.

FIG. 15—Syphilitic Tooth—Not fully developed.

FIG. 16—Appearance of a tooth which has partially been destroyed by pyorrhea.

should be used to prevent ulceration. The following should be used for soreness of the gums:

℞ Tincture of Iodine.....one teaspoonful
Water .....one ounce
Mix.
DIRECTIONS: Paint the gums three times a day.

Or:

℞ Powdered Alum.
DIRECTIONS: Place a teaspoonful in half a glass of warm water and use as a gargle.

GOITER

Definition.—Goiter is a term applied to a swelling in the front of the neck caused by an enlargement of the thyroid gland. This structure, which lies between the skin and the front of the windpipe, and which in health is not large enough to give rise to any external prominence, is liable to occasional variations in size, more especially in females, a temporary enlargement of the gland being not uncommon at the menstrual periods, as well as during pregnancy. Under this heading we shall consider the two diseases which commonly go by this name, viz., simple goiter and exophthalmic goiter.

Simple Goiter is not to be confounded with exophthalmic goiter, which is quite a separate disease, and in which the thyroid may be only slightly or not at all enlarged. In the disease now under consideration, however, the swelling is well marked, and is not only unsightly, but may by its growth occasion much discomfort, and even give rise to serious symptoms from its encroachment on the windpipe and other important parts in the neck. The size to which goitrous growths may attain is extraordinary, Alibert recording cases of goiter where the tumor not only enormously enlarged the neck but hung down over the breast, or even reached as low as the middle of the thigh.

Causes.—Simple goiter is a marked example of an endemic disease. There are few parts of the world where it is not found prevailing in certain localities, these being for the most part deep valleys in mountainous districts. The wide-spread nature of the disease has naturally led to extensive inquiry and specula-

tion as to its origin. The most generally accepted view has been that which ascribes the malady to the use of drinking-water impregnated with the salts of lime and magnesia, in which ingredients the water of goitrous districts would appear always to abound. Although this view is supported by the fact that goiter has been much decreased in whole districts by the expedient of obtaining a new water-supply, it would appear from various facts, such as that certain wells in districts are known to be goiter-producing, while neighboring wells with apparently the same water are safe, or that the water is rendered quite innocuous by boiling—from such facts it appears that the cause is hardly so simple as formerly supposed. It has been recently suggested that it may be due to a microörganism or other parasite infesting particular waters. It has also been suggested that telluric influences due to want of sunlight, etc., combine with the effect of the drinking-water in developing the disease. It is noteworthy that goiter can often be cured by removal from the district where it prevails, as also that it is apt to be acquired by previously healthy persons who settle in goitrous localities. It is only in such places that the disease shows any hereditary tendencies. It is noteworthy also that women are far more often affected than men.

Symptoms.—In districts where the disease prevails, the goiter usually appears in early life, often from the eighth to the twelfth year. Its growth is at first slow, but after several years of comparative quiescence a somewhat sudden increase occasionally occurs. In the earlier stages of the disease the condition of the thyroid gland is simply an enlargement of its constituent parts, which retain their normal soft consistence. But in the course of time other changes supervene, and the gland may become the seat of cystic formations, or acquire hardness from increase of fibrous tissue or calcareous deposits. Occasionally the enlargement of the gland is uniform, but more commonly one of the lobes, generally the right, is the larger. In some rare instances the disease has been noticed to be limited almost entirely to the isthmus which connects the two lobes of the gland. The growth is unattended by pain, and is compatible with a fair measure of health. Sometimes, when the goiter becomes large the voice grows hoarse and toneless, but only very rarely is there any interference with breathing or swallowing.

Treatment.—The first step is usually the removal of the person from the affected locality, and attention to general hygienic rules. In young persons a slight enlargement may simply show an increased demand of the system upon the functions of the thyroid gland, and this may be satisfied by administration of extract of sheep's thyroid, when the swelling subsides. The employment of burnt sponge as a cure for goiter was in vogue till Dr. Coindet of Geneva showed that its virtues were in all probability due to the iodine which it contained, and proposed the latter as a substitute. His views have been borne out, and iodine and its preparations have been uniformly adopted as a powerful remedy in this disease. Iodide of potassium appears to be one of the best modes of administration. The external application of iodine to the goiter has also proved of great use, and was a method of treatment adopted with singular success in India. An ointment of biniodide of mercury was applied by means of a spatula for about ten minutes after sunrise, and the patient was placed with his goiter exposed to the rays of the sun for six or seven hours. This application, though unaccompanied by the heat of the sun, has been successfully adopted. Surgical treatment is necessary in certain cases, where a distinct tumor or large cyst occupies the gland. Removal of the whole thyroid, which is the seat of goiter, is, however, inadvisable, since it plunges the patient into the condition of myxedema.

The following prescription will be found very good:

℞ Potassium Iodide.....one-half teaspoonful
Water .....four fluid ounces
Mix and dissolve.
Directions: Ten drops in water, three times a day.

Exophthalmic Goiter is the name applied to another form of enlargement of the thyroid gland, differing entirely in its pathological connections from that above described. In this disease the goiter is but one of four symptoms which form the most noticeable features of the disease, viz., extreme nervousness, palpitation of the heart and throbbing of the great vessels, enlargement of the thyroid gland, and protrusion of the eyeballs. This group of symptoms is often known also by the names of Graves's disease and Von Basedow's disease, in reference to the physicians by whom the disease was first recognized and described.

Causes.—The exact nature of exophthalmic goiter is still uncertain, but it is to a great extent a nervous ailment, while the experiments of Bernard, Brown-Sequard, Schiff, and others upon the functions of the sympathetic nerve in the neck lend support to the view that most of the symptoms are referable to this nerve, which plays an important part in controlling the action of the heart and regulating the caliber of the blood-vessels. In some cases of exophthalmic goiter, the nerve has been found diseased, though in most no such change is to be found after death. Others refer the malady with more probability to some disorder of the whole group of glands of which the thyroid, thymus, and pituitary body are the most important, the nervous symptoms being of secondary origin.

Although occasionally observed in men, this disease occurs much more commonly in women, and begins comparatively early in life. It is generally preceded by ill health in some form, more particularly impoverishment of the blood, and nervous or hysterical disorders, and is occasionally seen in cases of organic heart disease. It has sometimes been suddenly developed as the result of fright or violent mental emotion.

Symptoms.—The first of the symptoms to appear are generally the nervousness and the palpitation of the heart, which is aggravated by the slightest exertion and may be very severe. An uncomfortable sensation of throbbing is felt throughout the body, and many of the larger blood-vessels are seen to pulsate strongly like the heart. The enlargement of the thyroid gland generally comes on gradually; it rarely increases to any great size, thus differing from true goiter.

Accompanying the goiter a remarkable change is observed in the appearance of the eyes, which attract attention by their prominence and by the fact that a space of the white of the eye is left exposed all round the iris. A startled expression is thus given to the countenance. In extreme cases the eyes protrude from the sockets to such a degree that the eyelids cannot be closed, and injury may thus arise to the constantly exposed eyeballs. Apart from such risk, however, the vision is rarely affected in this disease. Much difference of opinion prevails as to the immediate cause of the protrusion of the eyes, but it is generally ascribed to the increase of the fatty tissue and distention of the blood-vessels of the orbits. It occasionally happens

that in undoubted cases of the disease one or other of the four above-named characteristic phenomena is absent, generally either the goiter or the exophthalmos. The palpitation of the heart is the most constant symptom. Sleeplessness, irritability, disorders of digestion, diarrhea, uterine derangements, muscular tremors, and an unusual readiness to perspire freely are common accompaniments.

Exophthalmic goiter is not often a directly fatal malady, but complete recovery is less frequent than partial improvement.

Treatment.—A few cases, as stated above, recover when placed in a condition of rest and freedom from worry, this being the most important factor of treatment in every case. It has been noticed that pregnancy often has a favorable influence upon cases of considerable duration in women. Where anemia is present iron is indicated, although in some cases it is found to be unsuitable. In allaying severe palpitation ice applied to the cardiac region and to the thyroid gland is sometimes beneficial. Iodine is of no service in this disease, or is actually injurious; and the same applies to thyroid extract. Anti-thyroid serum prepared from the blood of sheep and the milk of goats from which the thyroid gland has been recently removed have been tried, but with little benefit. Various other forms of treatment by digitalis, by belladonna, by phosphate of soda, have had their advocates, and have in isolated cases been of some use. Removal of part of the gland by operation or exposure of it to the action of X-rays is sometimes practised with success.

DISEASES OF THE NOSE

The nose, so far as the skin covering is concerned, is subject to the same diseases as the skin of other parts. Redness of the skin of this part may be, on account of its disfiguring character, very annoying. It may be due to poor circulation in cold weather, partaking of the nature of a chilblain; very frequently it is due to constant indulgence in alcohol; habitual indigestion also tends to bring on a condition of redness, while any chronic state of inflammation or source of irritation in the interior of the nose may manifest itself by redness on the surface. Among the skin diseases, acne, lupus, and erysipelas are specially prone to affect this site.

Acute inflammation of the nose, or rhinitis, is generally a catarrhal condition affecting the mucous membrane, and is commonly known as a cold in the head. It may be due to infection, though less commonly to the inhalation of irritating gases. Injuries to the nose are specially liable to be followed by erysipelas in some persons. Boils occasionally develop just within the entrance to the nose in connection with the hairs there, and in this locality give rise to great pain and considerable danger. Diphtheria is a form of acute inflammation which occasionally spreads to the nose, and is said in this site to be almost invariably fatal. Hay fever is a peculiar form of acute inflammation of the nose.

FOREIGN BODIES IN THE NOSE

Buttons, beads, slate-pencils, peas, and small stones are often pushed into the nose by children, and as the floor of the nose slopes slightly backward and downward, they readily pass in beyond reach. Concretions form in the nose, as in other hollow organs, round small blood-clots, hairs, and the like, and these may grow to a considerable size.

Symptoms.—At first the foreign body may, if smooth, set up no symptoms, but soon swelling of the nose, discharge from one nostril, headache and various pains appear, especially if the body be one which swells, like a pea. These symptoms may to a certain extent pass off, and if the body be wedged in tightly beneath the inferior turbinated bone, it may remain there for years, causing little discomfort, till a severe attack of inflammation comes on. When there is a constant discharge of matter from one nostril without any known cause, it is very probably due to some foreign body which has previously been introduced into the nose.

Treatment.—Tickling the nostril with a feather, or giving a large pinch of snuff, to provoke a vigorous sneeze, while the opposite nostril is closed by pressure with the finger, should be tried first of all. Very often this will drive out the stone, pea, etc. If not, removal by a doctor, aided by a speculum and a bright light, is comparatively easy, much more so than in the case of bodies pushed into the ear. In the case of children, chloroform is generally necessary, as the child will not remain still.

POLYPUS

Definition.—A polypus is a growth of a soft, jelly-like character, with more or less of a stalk arising usually from the middle turbinated bone.

Causes.—It is the result of chronic inflammation in the hinder part of the nasal cavity, produced by frequent colds, and disease of the cells of the turbinated and the ethmoid bone, following on some of the acute infectious diseases, or due to suppuration in one of the air cavities adjoining the nose.

Symptoms.—There is usually a sense of stuffiness, and obstruction to breathing through the nose, while frequently the patient distinctly feels something flapping as he breathes or talks. Many of the symptoms mentioned under chronic inflammation are often present, as this condition is found in a greater or less degree along with polypi. When the nose is examined with a bright light and mirror, part of the polypus is often seen, and being of a glistening, grayish color, contrasts strongly with the red mucous membrane of the nose.

Treatment.—These polypi occasion no danger to life. Malignant tumors are occasionally found growing in the nose, but are very rare, and when they do occur are hard in texture, unlike these soft mucous polypi. The polypi are, however, seldom or never single, and after a large one has been removed the smaller ones around grow into its place and must in turn be removed. The removal is generally effected, quite painlessly, by passing a wire "snare" along the corresponding nostril, catching the polypus, and tightening the wire around its stalk till it can be pulled off, and when periodically done may at last result in a complete cure. Recurrence is also prevented in many cases by cauterizing the inflamed mucous membrane from which the polypi are growing, or, in cases due to suppuration in the ethmoidal air-cells, by a severer operation designed to remove completely the lateral part of the ethmoid bone.

SUPPURATION IN THE SINUSES OF THE NOSE

Suppuration in the cavities connected with the nose is of fairly frequent occurrence. Suppuration in the frontal sinus is rare,

because of the very efficient drainage from this cavity straight downward into the nose, while suppuration in the cells of the sphenoid and ethmoid bones, unless it causes polypi, is apt to escape notice; but the antrum of Highmore, lying in the maxillary bone close to the roots of the upper row of teeth, from which it is separated only by mucous membrane and thin bone, and opening only by its upper part into the nose, is very liable to become inflamed and to have pus collect in it.

Symptoms.—The effects of a collection of pus in the maxillary sinus may be very slight; intermittent pain of a neuralgic character often felt above one eye, toothache, and slight swelling of one cheek may be the only signs for a long time. Generally, however, attention is called to the nose by a slight intermittent discharge of matter from one nostril, especially when the head is laid upon the opposite side. The small operation of pushing a hollow needle through the plate of bone separating the nose from the antrum, which is no thicker than a calling-card, is bloodless and almost painless, and if pus runs from the needle the diagnosis is confirmed.

Treatment.—An opening must be made into the cavity, and a small silver drainage-tube is usually inserted into it, either through the socket of a decayed tooth, if there be one, or through the angle between the gum and lip above the eye-tooth. There is little pain in making this opening, and the cavity is thereafter syringed daily with some weak antiseptic lotion till the pus disappears, when the drainage-tube is removed.

SNEEZING

Definition.—Sneezing is a sudden expulsion of air through the nose, designed to expel irritating materials from the upper air-passages. In sneezing, a powerful expiratory effort is made, the vocal cords are kept shut till the pressure in the chest has risen high, and air is then suddenly allowed to escape upward, being directed into the back of the nose by the soft palate.

Causes.—Sneezing may be caused by the presence of irritating particles in the nose, such as snuff, the pollen of grasses and flowers, etc. It is also an early symptom of colds, influenza, measles, and hay fever.

Treatment.—It is relieved by inhalations of menthol, by application of cocaine in solution to the nose, or by using snuff.

MATERIA MEDICA

ABSINTHE.—Absinthe is a liquor prepared by steeping several herbs, especially anise and wormwood, in alcohol for several days. It is greenish in color. It was first introduced into France by soldiers stationed in Algiers between 1830 and 1850, for whom it had been prescribed as a remedy for fever, and its employment spread thence into other countries. Its use becomes a habit like that of alcohol, but its effects are more demoralizing. It produces hallucinations and loss of mental balance without destroying the power of action. Its habitual use brings on tremors and paralysis in the arms especially, with epilepsy and delusional insanity.

Alder

Adrenalin is an extract derived from the suprarenal glands of animals. It was first prepared by Takamine in 1901 as a crystalline substance. Similar extracts are made under the names of hemisine, renaglandin, supranenin, adnephrin, vasoconstrictine, etc.; and the substance is also prepared synthetically. Commonly it is used in strength of 1 part to 1000 of water or oil, in a spray for hay fever, etc., in suppositories for piles, by injection for collapsed conditions, and by direct application to check bleeding from wounds.

Alder.—This shrub is a native of the New England States. Its bark and leaves are valuable as an alterative and in lung troubles. A tea sweetened with sugar will be found good for the removal of worms in the stomachs of children. The bark is recommended to purify the blood. It may be taken plain or in combination with other drugs.

Alkali is a substance which neutralizes an acid to form a salt, and turns litmus and other vegetable dyes blue. Alkalies are generally oxides or carbonates of metals. Ammonia, lithia, potash, and soda are the principal alkalies; the carbonates of these act as weaker alkalies, and their bicarbonates still weaker. Lime, magnesia, baryta, and strontia are called alkaline earths, and act as alkalies. Further, substances which in the body are converted into alkalies, such as acetates, citrates, and tartrates, are called "indirect" alkalies.

In poisoning by acids, one at once administers dilute alkaline solutions. Caustic, i.e., undiluted, alkalies are used to destroy warts. Bee-stings and insect-bites cause irritation because of an acid injected by the insect, and consequently are relieved by weak alkaline applications, especially by ammonia or carbonate of ammonia (for example, in aromatic spirits of ammonia), which are most penetrating. Internally one administers very weak solutions of soda and potash or their bicarbonate in powder, for bronchitis, when the phlegm is thick and hard to cough up. In weak digestion, they are taken at the beginning of a meal to stimulate the flow of acid gastric juice; or in heartburn, after a meal, to neutralize the excess of acid. In gout and general acidity they are much used. The dose of bicarbonate of soda (baking-soda) or of potash is twenty grains (or as much as can be heaped on a ten-cent piece), and of carbonate of ammonia five grains, or, in the

Almond

form of aromatic spirits of ammonia, a small teaspoonful, well diluted with water.

Almond.—This tree resembles the peach tree, and it flowers in the spring before the leaves come out. It is largely cultivated in the United States and in the southern part of Europe. The seeds, or nuts, yield a valuable oil, which is serviceable in relieving tickling coughs. It also has an action on the urinary organs. In the scalding or burning of the urine and in the diseases of the kidneys, when combined with other remedies, it has been found serviceable. The oil is used in alcoholic spirits, or with oil of savina in so-called diuretic drops.

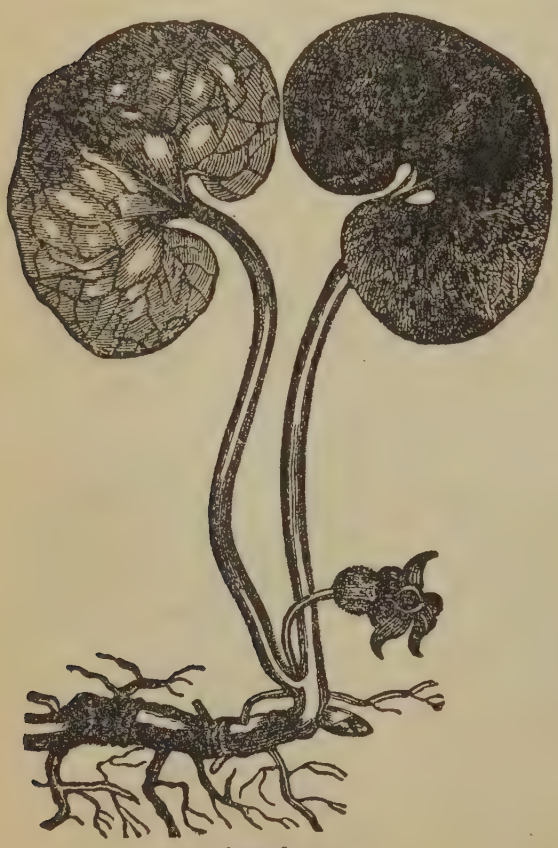
Aloe.—There are many varieties of this plant found in Europe and Africa. It blooms once a year, and its leaves yield a valuable drug. Of the many varieties, one is used for horses and the others for humans. It is a warm, stimulating purgative, operating with peculiar force on the large intestine and especially on the rectum. On account of its latter action it is never used alone, because it may cause piles. It is good for obstruction of the menses. It is employed in antibilious pills and is used to quicken the circulation.

Aloe

Alum is the sulphate of aluminium and potassium. Ammonia alum is the sulphate of aluminium and ammonium. It is an astringent, and may be used in powder to rub into wounds when bleeding will not stop of itself. As an emetic, a teaspoonful of powder may be given in water. The most valuable use is in an eye-wash for inflamed, painful, and bloodshot eyes, the strength for best results being about four grains to one ounce of water.

Amyl Nitrite is a volatile, oily liquid prepared by the action of nitric and nitrous acids upon amylic alcohol. It resembles other nitrites in its power of relieving spasms and dilating blood-vessels, and it acts with great rapidity, producing its effects in a few seconds.

Aniline is a substance derived from indigo by distillation, from coal-tar by extraction, or manufactured from benzene. It is a colorless liquid, with peculiar aromatic smell and burning taste. From it many vivid and beautiful dyes are made and extensively used. Aniline itself is a narcotic poison, though most of the colors are harmless in moderate amount. In some persons the dyes, when brought into constant touch with the skin, as in colored stockings, etc. (especially red and black goods), cause excessive irritation and eruptions, such as eczema or boils, which are very difficult to get rid of. Probably these are due, not to the aniline, but to the presence of arsenic, which is used in the process of manufacture, and in cheap dyes not completely removed.



Asarabacca

Aniseed.—The anise plant has of late been cultivated in Europe and America, and its seed yields a valuable oil. The plant acts like fennel. It is valuable for gas on the stomach and in coughs and colds. It is also good for dyspepsia in children.

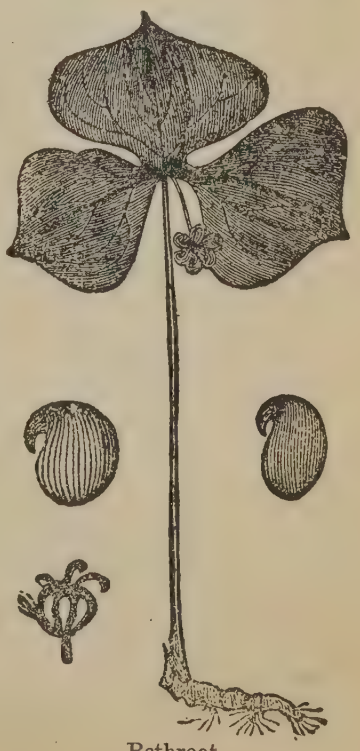
Archangel.—This plant is common in southern France but is cultivated in the United States; it flowers in June and July. The parts used are the root, stem, and seed. It is administered with advantage in disorders aris-

ing from flatulence and debility of the stomach and digestive organs, and is recommended for nervous headache pains. It may be given for pains in the breast, used in the form of an infusion.

Asafetida.—This plant was formerly obtained only from Persia, but of late it has been raised in England. The gum which exudes from its roots is very useful in hysteria and other nervous disorders, and is efficacious in spasmodic asthma. Together with squill, it has been found beneficial for coughs.

Asarabacca.—This is a stemless plant found in the United States, mostly in shaded woods and in clayey soils. The flowers are purple in color and almost concealed in the ground. It is used as an aromatic, a stimulant, and an expectorant, and has been employed with success in intermittent fevers and for colds and pulmonary diseases. The pulverized leaves are used in snuff-powders. It is given in the form of a syrup or infusion, but only in small doses, as it may start vomiting.

Arnica is a medicine derived from the common arnica, a plant of the western United States and Europe. The tincture of arnica, made by steeping the root in rectified spirit, is the preparation most employed, and is very extensively used as a domestic remedy. Externally the tincture is used as a lotion for application to sprains and bruises, which it relieves by virtue of its weakly irritant action. It is seldom used internally, though sometimes it is given to stimulate digestion.



Bethroot

Bethroot.—This is a small plant found in the United States, and blooms only once a year. It is recommended as a tonic and antiseptic. It is also said to stop internal hemorrhage, and is especially good for blood in the urine and for spitting of blood. The best way of giving this drug is to make an infusion.

Blue Pill, or mercury pill, is a favorite household purgative. It con-

tains mercury, confection of roses, and licorice. Not only is it purgative, but it also stimulates the activity of the liver. The dose is from three to eight grains, and usually four or five grains should be given to an adult.

Bloodroot

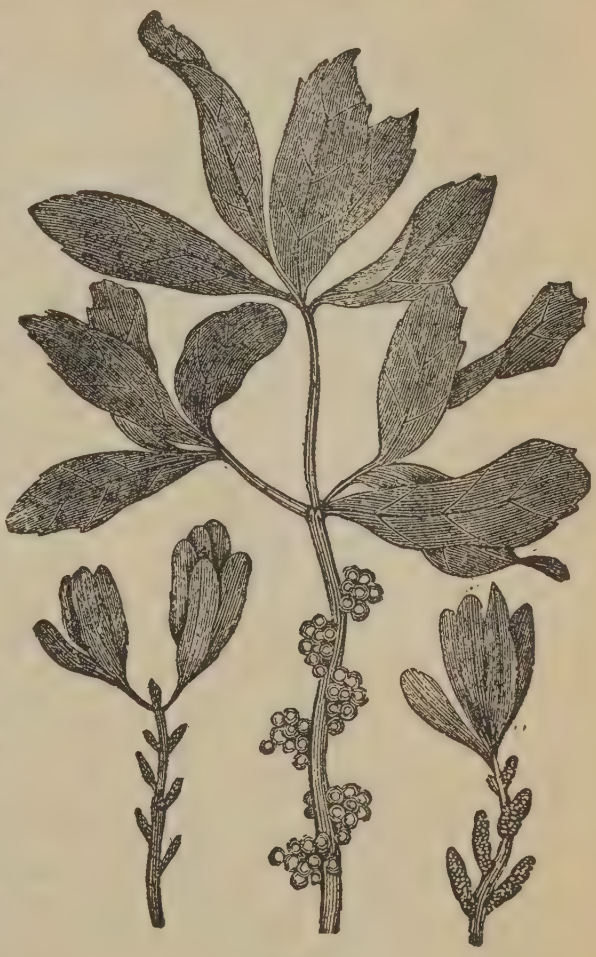
Bloodroot.—This plant is found in the lowlands of the United States. The drug extracted from its root acts as an emmenagogue and expectorant. Given with other drugs, it is recommended in all pulmonary diseases. An infusion is made by taking two teaspoonfuls of the powdered root and adding to it a pint of boiling water. It is also recommended for painful and delayed menstruation.

Boracic Acid, or **Boric Acid**, is found in volcanic districts, or is prepared from borax. It is a mild antiseptic, and is used very widely for dressing wounds, either dusted on as powder, or in a lotion (1 part to 30 of water). In the same strength it makes an extremely good eye-wash for painful and inflamed eyes. Lint is sold ready soaked in boric lotion, dried, and requires only to be dipped in water and applied. Offensive perspiration of the feet is checked by dipping the stockings in boric lotion and drying them before wearing. Boracic ointment is used for dressing ulcers or for lubricating instruments. Boric acid is given internally in dyspepsia due to fermentation, and in inflammation of the bladder in ten- to twenty-grain doses three times a day, but being an acid is apt to irritate the stomach.

Borax, or biborate of soda, acts in much the same ways as boric acid, but has not its acid reaction. Its chief use is in the form of a lotion (about 1 part to 30 of water) in all forms

of itching and chapping of the skin. In thrush and other forms of irritation about the mouth in children, the glycerine of borax, smeared on several times a day, is very soothing. To clean the mouth as well as soothe it, borax in honey wiped over the gums and tongue is very good. Borax is also given internally in epilepsy.

Bayberry.—This tree is found through the marshy regions of the United States, and from the bark of its roots is extracted a drug which is a narcotic, an astringent, and an emetic. Applied as a poultice for scrofula, it will be of benefit. It is also good in jaundice. It may be used as a decoction, or the powder itself may be used.



Bayberry

Balsam of Tolu.—This tree is a native of South America and is cultivated to a great extent. It is the mildest of all balsams. It has been highly recommended for the relief of bronchial spasms, as asthma and whooping-cough, and is useful in coughs as an expectorant.

Bismuth is a metal, of which the carbonate, oxide, subnitrate, salicylate, and oxychloride are much used in medicine. In irritative and painful conditions of the stomach or of the bowels, when diarrhea or vomiting is present, they have a marked sedative action. The salicylate of bismuth especially is used to check diarrhea, the usual medicinal dose of it or of the subnitrate being about twenty grains. The car-

Balsam of Tolu

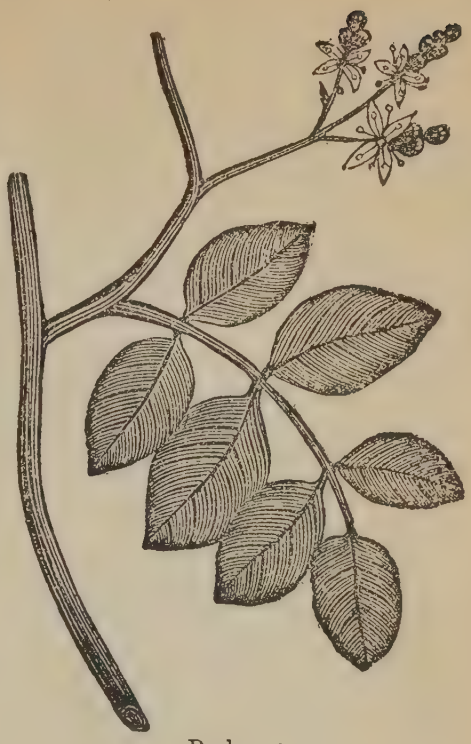
bonate and oxychloride are of great use as an aid to X-ray diagnosis. Suspended in some sterile fluid, they may be injected into sinuses, or they may be given by the stomach in doses of one or two ounces with milk, oatmeal, or gruel. The mass of bismuth forms an opaque shadow and shows the outline of the cavity in which it lies. Thus the physician can see the size and position of the stomach in an X-ray photograph, or can trace a meal in the passage through the bowels. It must be remembered that, given internally, the bismuth preparations turn the stools black, so that persons taking them need not be alarmed at this appearance.

Externally, as dusting powder, they are used, both for a cosmetic and in eczema and other moist conditions of the skin, being commonly mixed, in equal proportions, with starch powder or oxide of zinc, or both.

Bitters.—The two most bitter substances are probably strychnine and quinine, which have other still more powerful properties. But when one speaks of "bitters" one means substances of milder properties, which are used to stimulate the functions of the stomach and so give an appetite and aid digestion. Calumba, chiretta, gentian, and quassia are the chief pure bitters, others containing tannin and being also astringent. Bitters should be taken not less than half an hour before meals to produce the best effect.

Barberry.—This plant is common among the mountains of the eastern parts of the United States. The shrub matures very early and the berries are ripe in June. It

is valuable as an antiseptic and an astringent. The whole bush is very acid; the bark is yellow in color and very bitter. The berries give off a red juice which is very acid, forming a pleasant and useful drink for fevers and quenching thirst. It will also be found valuable in cases of dysentery on account of the acid properties. It can be made up as an infusion, or sugar may be added to form a syrup.



Barberry

Benzoic Acid is an antiseptic. It, or benzoate of ammonium, is given internally in doses of fifteen grains in all cases of suppuration along the urinary tract, especially in inflammation of the bladder with decomposition of the urine. Other acids are neutralized in the blood but it is excreted as hippuric acid and acidifies the urine.

Bromides are salts of bromine. The bromides of potassium, sodium, strontium, and ammonium are used in medicine, the first being slightly more depressing and the last more stimulating than bromide of sodium. They act chiefly as paralyzers of the brain and sensory nerves, dulling the sense of pain. Sleeplessness due to mental labor and worry is better overcome by bromides than by any other drugs, the dose being twenty grains or more at bedtime. Epilepsy and other nervous convulsive affections are treated by long courses of bromide. Maniacal attacks, delirium, neuralgia, all yield to it, especially when combined with other drugs like chloral, opium, hyoscyamus. When given repeatedly, the usual dose is twenty grains three times a day. It must not be taken recklessly, or its use may become a habit.

Black Snakeroot.—This is found all over the Eastern States. It stands about three feet high, with small blue blos-

soms having a strong aromatic odor, and its medicinal properties are contained in its roots. It has been used as an aromatic and emmenagogue. It is also used in all fevers and in cases of obstructed menses. The best way is to make a tea and give it freely.

Blackberry.—This plant is found growing abundantly throughout the United States

Black Snakeroot

in swampy regions. The bark or berries boiled up form an excellent astringent for diarrhea. It is also good for increasing the digestion.

Blue Flag

Blue Flag.—This is found throughout the United States on borders of swamps and wet meadows. The root is very valuable in several diseases. Given in doses of from six to eight grains, night and morning, it proves gently laxative. It is excellent in venereal diseases, and is highly recom-

mended for dropsy, combined with the root of male-fern. It should be made into a tea and partaken of freely.

Boneset.—This herb is found throughout the United States in meadows and swamps, and is easily recognized by the stem growing through the leaf. It is recommended as a cathartic, emetic, or tonic. It is given in the form of an infusion or powder for intermittent fever with complete success, and is valuable in yellow fever. Boneset tea is also recommended as a tonic in dyspepsia.

Butternut.—This tree is very common in the United States. The extract made from the inner bark only is employed, and it was first introduced as a substitute for ordinary cathartics. When given alone, in doses of from fifteen to thirty grains, it operates as an active cathartic without occasioning heat and irritation. It is given in the form of an extract made into pills; dose, four or five, the size of a pea.

Burdock.—This weed is found abundantly in the United States and in Europe, in damp places and uncultivated ground. It is used as an alterative. For ulcers, rheumatism, and skin diseases, it is used in the form of a decoction. It has also been found valuable for dropsy. The root or seeds may be made up as a decoction, three teaspoonfuls of fresh root added to half a pint of water. To be taken freely when used to purify the blood.

Burdock

Canada Balsam.—This tree is found plentifully in Canada and the northern part of the United States, and exudes a resinous juice, which, when given internally, is a stimulant and laxative. It is used on sore nipples and cuts, with good clean results. Some recommend it for leucorrhea.

Copaiba.—This tree is a native of the Spanish West Indies and South America. The juice tapped from it is very thick and yellow, with a very disagreeable odor. It is used to increase the flow of urine. This juice is not taken

Copaiba

plain, but mixed with slippery elm and sugar.

Camphor is a solid, oily substance, distilled from the wood of a species of laurel. Its action internally is very uncertain, but camphor-water is much used as a heart stimulant and for a flavoring ingredient in medicines. Externally liniment of camphor and camphorated oil (one ounce camphor in eight ounces of olive-oil) are very useful in chronic painful conditions. Many people wear a small bag containing camphor during an epidemic, but, though it certainly keeps off fleas and lice, it probably affords no protection against infection.

Caraway Fruit, generally called caraway-seed, is used to prepare caraway-water and caraway-oil. A tablespoonful of the former or two drops of the latter on sugar is useful for checking colic, griping pains in children, and flatulence.

Camomile.—This herb is found especially abundant in England, but it is cultivated in the United States. The main action of the drug extracted from its flowers is as a stimulant. It is recommended for people run down in health who are subject to attacks of lung trouble. It is best given in the form of a tea, which should be given hot.

Camomile

Caseine is that part of milk which forms cheese or curds. It is produced by the union of a substance, caseinogen, dissolved in the milk, with lime salts also dissolved in the milk, the union being produced by the action of rennin, a ferment from the stomach of the calf. The same change occurs in the human stomach as the first step in the digestion of milk, and therefore when milk is vomited curdled it merely shows that digestion has begun.

Calomel, or subchloride of mercury, is not to be confounded with corrosive sublimate or perchloride of mercury, a far more active drug and a deadly poison.

Cannabis Indica, or Indian hemp, consists of the flowering tops of *Cannabis sativa*. It is, in small doses, a stimulant and intoxicant, and in larger doses a narcotic. In the stage of intoxication persons under its influence become much more excited than do the devotees of alcohol, and one name of the drug, hashish, is associated with the name of the sect of "Assassins," whose crimes were perpetrated in the fury induced by the drug. Others, according to their temperament, show an excess of politeness, and "salaam" to bystanders till exhausted, while still others become extravagantly merry, losing the sense of personality and assuming extraordinary attitudes. Finally sleep comes on, attended by happy or amusing dreams of a sensuous character.

It is used to relieve spasm and dull pain, especially in neuralgia, migraine, asthma, colic, and pain originating in the ovaries or womb. It is also given for sleeplessness, especially when associated with delirium. Its use may become a habit, which must be broken.

Catnip.—This plant is found throughout the United States, especially on uncultivated ground. It is useful in all kinds of fevers, producing perspiration without increasing the heat of the body. In the form of a warm tea it is given for colds, causing a profuse perspiration, and is also given for gastritis.

Catnip

Cantharides, or Spanish fly, is a powder made of the body and wings of a dried beetle

which inhabits Spain, Italy, Sicily, and southern Russia. It is an irritant, firstly, to the part with which it is brought in contact, whether the skin surface or the stomach, and, secondly, to the genital and urinary organs, by which it is discharged from the body. The latter effect, which causes difficulty in passing urine, is called strangury.

Its chief use is for blistering, and it may be applied as a plaster, in a paste, or painted on in ethereal solution called liquor epispasticus. Very small doses are sometimes given to stimulate the action of the kidneys.

Licorice.—This is found mostly in southern Europe. It has been cultivated in England especially for medicinal use. The root of this plant is at present used principally to relieve coughs and check inflammation of the lungs. It is made up as a decoction with slippery elm bark, and given every few hours.

Capsicum

Capsicum. — This plant has been grown in the West Indies and, of late, in the United States. The fruit will ripen in any temperate climate, and furnishes the condiment known as Cayenne pepper. It is one of the purest and strongest stimulants we have, and has also proved valuable as a general tonic. It is given to warm the stomach and when too much gas is present, and has also been advised for rheumatism and sore throat. The most convenient form is the tincture; this may be given in

ten-drop doses internally, or else applied pure over the skin. Frequent doses given internally will be found valuable to reduce the fever and break up a cold.

Gentian.—This is found among the mountains of Europe, especially where the climate is warm. The plant blossoms early in spring, and its root is a very useful tonic. In dyspepsia it has obtained much celebrity, and not without foundation. It is given together with other tonics and astringents, which appear to increase its action. This is the main drug in many restorative bitters.

Gamboge.—This is a tall yellow tree found mostly in China. The gum is obtained from the tree by cutting the bark, when it runs out. It has the action of a drastic cathartic, but is used in small doses as a mild laxative. Mixed with other drugs, it is used for dyspepsia.

Wild Carrot.—This weed grows in many parts of the United States, and is very common in uncultivated fields. Its seeds and roots are used in the form of a decoction, which acts on the urinary organs, and it is specially good for stone in the bladder.

Celandine

Castor-bean.—The castor-oil plant is a native of the East Indies and Africa. In those countries it is now cultivated to a large extent, and its fruit, the castor-bean, yields the well known remedy castor-oil.

It is a very mild cathartic, unloading the bowels of their contents without irritation, and is therefore recommended for ulceration of the bowels; also good for colic of the bowels.

Celandine.—This herb is found in meadows and along the banks of rivers. It grows a few feet high, with a small yellow flower, having four leaves. It acts on the urinary organs, and is also used as a stimulant. The juice rubbed on warts removes them; it also cures ringworm and cleans old ulcers. It is used largely for piles in the form of an ointment.

Cicuta

Cicuta (Wild Parsley).—This herb was formerly found only in Europe, but of late it has been naturalized in the United States. It is found mostly in uncultivated ground. Its root is a powerful narcotic and resolvent, but is not dangerous in very small doses often repeated. Acting as a sedative, it is valuable for relieving pain in acute diseases. It is used mostly in ointments, and has occasionally been found good for swollen glands of the neck. For use in tumors of the skin it has been made up in the form of plasters.

Cascara Sagrada is the bark derived from *Rhamnus purshiana* or *Rhamnus frangula,* from which a liquid and a solid extract of powerful purgative action are prepared. It is one of the most useful remedies for habitual constipation, owing to its mild action. The full dose is a teaspoonful of the fluidextract or about four grains of the solid. But it is best taken in small doses of five or ten drops of the fluidextract after each meal, or night and morning; gradually this may be decreased and finally discontinued, the bowels continuing regular in action. The

disagreeable taste may be lessened by mixing the dose with an equal quantity of glycerine, or the concentrated fluidextract may be taken in capsules.

Cloves.—The clove tree is a native of the Molucca Islands, but is now cultivated in the West Indies and in various parts of Asia. The flowers are collected before they are ripe and allowed to dry. It is used as a bitter or together with other vegetable cathartics. An oil is also extracted from the buds, bark, and stalks, which is used as a remedy for toothache.

Colocynth.—This vine has been cultivated in gardens, but it blooms only once a year. Colocynth is one of the most powerful and active cathartics. When given alone, without other drugs, it is apt to occasion severe griping. It is usually given in combinations of drugs for dyspepsia.

Charcoal, or carbon, is obtainable in two forms, bone-charcoal and wood-charcoal. They are made by burning bones or wood without access of air, the bone-charcoal being afterward purified from bone-earth by washing with hydrochloric acid. Bone-charcoal, which has much finer pores than wood-charcoal, has the same properties, and in addition it destroys vegetable dyes and so is a bleacher, and destroys alkaloidal poisons and so may be given as an antidote to morphine, strychnine, etc. (half an ounce of charcoal neutralizing about one grain of poison). The mode of action of charcoal is that it is porous, and so absorbs discharges, etc., with which it comes in contact, and that, in its dry state, it has the power of condensing in its pores large quantities of oxygen, which combines with organic substances, like evil-smelling gases, to form simpler innocuous substances.

Dry charcoal may be laid on plates about a sick-room to destroy bad odors, but this is better effected by thorough ventilation. It forms a good application in poultices to foul ulcers, the charcoal being sprinkled dry on the surface of a linseed poultice. Internally it is given in twenty to sixty grain doses by cachets, or in charcoal biscuits, to relieve that form of dyspepsia associated with flatulence, and must be taken dry. It is sometimes used in filters and for tooth-powder, though it is unsuitable for either purpose.

Collodion is a thick, colorless, syrupy liquid, made by dissolving gun-cotton in a mixture of ether and alcohol. When

painted on the skin the ether and alcohol evaporate, and leave a tough film behind. *Flexible collodion,* made by adding some castor-oil and Canada balsam, is more elastic, and does not crack through the movement of the skin. *Blistering collodion* contains cantharides, and, being painted on, raises a blister, to which at the same time it affords protection. *Medicated collodion* has various substances, such as salicylic acid, added to it, in order that these may remain in contact with the skin for a prolonged period.

Calumba.—This herb is a native growth of Africa and the East Indies. Its root acts as a tonic, giving strength to the stomach and intestinal canal, without stimulation, being especially good for dyspepsia. Together with other drugs, it will be found good as a restorative.

Cranesbill.—This pretty plant is common throughout the United States, blossoming in the early spring. Its root acts as a good astringent, helpful in hemorrhages, both internally and externally, also from lungs or womb. Made up as a decoction, it is good for leucorrhea. Made up as a syrup it is beneficial for relieving whooping-cough.

Cod-liver Oil is made in large quantities in Norway and Newfoundland by purification of the oil pressed from the livers of codfish. Its value lies in the fact that it is a liquid and easily digested form of fat, the biliary substances, mixed with the oil in small amount, possibly aiding its absorption. It seems also to aid the absorption of other food in wasting diseases. The oil is made much more palatable by being mixed with gum or glycerine, so as to form an emulsion, which then consists in about half its bulk of oil. Cod-liver oil with extract of malt is very nutritious, and generally readily taken by children. It is in wasting diseases, such as chronic consumption, debility with glandular enlargement, and rickets, that it is of most value. In the bronchitis of old people, it soothes cough and relieves the disease. And in various nervous complaints, such as neuralgia, nervous breakdown, and rheumatic gout, as also in some chronic skin diseases, it is much used.

An emulsion is taken more readily by children than the pure oil, and should be given in small amount at first. A teaspoonful after the evening meal for a day or two, increasing to a dessertspoonful, and later to a tablespoonful, always immediately

after meals, is the best way to commence its administration. Lemon juice removes its taste from the mouth after swallowing. Sometimes a child cannot be made to tolerate the oil, and it may then be administered by inunction. A tablespoonful is rubbed well into the abdomen every night, and a broad flannel binder is constantly worn and changed only once every two weeks.

Comfrey

Comfrey.—This plant is a native of central Europe, and of late has been cultivated in the United States. It is used as an expectorant and stimulant, and is especially valuable in consumption. With other ingredients, it is given for coughs and colds in the form of a syrup. It is said to stop leucorrhea.

Deadly Nightshade (Belladonna).—This herb is found growing in stony and shady places, along old wells and fences. The fruit is black and ripens in September. It produces heaviness of the head and dizziness, and dilates the pupils of the eyes. This plant, notwithstanding its poisonous quality, is used with great benefit in checking the growth of tumors. The leaves and roots are placed in warm water until the properties are extracted, then slippery elm is stirred in until a poultice is formed. It may be applied to boils and all hard glandular swellings.

Devil's-bit

Devil's-bit.—This is a native plant of southern Europe, but of late has been found in the mountains of North

America. Its root is useful in dropsy and sore throat, and has also been given for pains in the breast. It is used both externally and internally and may be given in the form of a tea or syrup.

Demulcents are substances which exert a soothing or protective influence upon the surface of the alimentary canal, and comprise mucilaginous substances like gum, isinglass, Iceland moss; oils like olive, linseed, and almond oils; starchy substances like arrowroot; also glycerine, borax, and mild alkalies, and fine powders like subnitrate of bismuth. They are used in cases of inflammation, particularly of the throat and stomach, in gargles or drinks, to protect these parts from the irritation of their own secretions; and after injury, such as that due to swallowing a corrosive poison, in order to soothe the pain and encourage healing in the injured parts.

Deodorants are substances which remove or lessen objectionable odors. Some, which have a powerful odor, simply cover other smells, but the most effective act by giving off oxygen, so as to convert the objectionable substances into simple and harmless ones. Volatile oils of plants, such as eucalyptus and turpentine, chlorine water, and chlorinated lime, peroxide of hydrogen, charcoal, dry earth, sawdust, and permanganate of potassium, are among the most powerful.

Dogwood

Their main use is to purify sewage, bilge-water, and toilets. Many powerful deodorants act, at the same time, as disinfectants. They are also used in sick-rooms to cover the odor of discharges, and the like.

Dogwood.—This beautiful tree is found throughout the

United States, but more plentifully in the Middle States. The bark or flowers are crushed and boiled in water; this is strained and used as a tonic or as a substitute for quinine, and is especially good for colds.

Dragon's-claw.—This orchid-like plant grows plentifully among the mountains of New York State. An infusion of the root is useful in different kinds of fevers, particularly in typhus, keeping the skin moist and producing no excitement.

Diaphoretics are remedies which promote perspiration. In many forms of disease, such as fevers and inflammatory affections, the action of the skin is arrested, and the surface of the body feels harsh and dry, while the temperature is greatly elevated. The occurrence of perspiration frequently marks a crisis in such diseases, and is in general regarded as a favorable event. In some chronic diseases, such as diabetes and some cases of Bright's disease, the absence of perspiration is a marked feature; while, on the other hand, in many wasting diseases, such as consumption, the action of the skin is increased, and copious exhausting sweating occurs. Many means can be used to induce perspiration, among the best known being baths, either in the form of hot-vapor or hot-water baths, or the exposure of the body to a dry and hot atmosphere or to beams of electric light in a special apparatus. Such measures, particularly if followed by the drinking of hot liquids and the wrapping of the body in warm clothing, seldom fail to excite copious perspiration. Antimony and ipecac appear to produce their diaphoretic action by their nauseating and depressing or relaxing effects; while others seem to act as direct stimulants to the function of the sweat-glands of the skin, such as the well known diaphoretics Mindererus spirit (acetate of ammonia), guaiacum, nitrous ether, and jaborandi. Opium acts powerfully as a diaphoretic, especially when in combination with ipecac, as in Dover's powder, or with antimony; and alcohol has similar properties. Diaphoretics are of great service in many diseases. When employed at the commencement of a catarrh or common cold, they frequently check it, and thus prevent the evils which are so apt to follow this affection. In acute dropsy due to kidney disease, such as that which sometimes results from scarlet fever, the hot-air or hot-water bath is a valuable remedy, and even in dropsical accumulations of long standing, when perspiration can be induced,

marked improvement in the symptoms generally follows. In certain circumstances, however, diaphoretics, particularly in the form of baths, may be unsafe, especially where there is any affection of the heart or lungs attended with embarrassed respiration; and in general in diseases where diaphoretics seem to be indicated, the physician is required to take into account the patient's whole condition in his selection of any one remedy for this purpose.

Dwarf Elder

Dwarf Elder.—This plant grows abundantly in the United States, and especially in uncultivated land. An infusion of its flowers and berries is found beneficial in dropsy. It also causes severe purging and vomiting. The inner bark is made into an ointment and used for piles.

Diuretics are substances which cause a copious excretion of urine by the kidneys. Unirritating watery fluids, such as milk and lemonade, are rapidly excreted. Substances which dilate the kidney arteries, as alcohol, spirit of nitrous ether, and salts of the alkalies, especially potassium salts, which disturb the composition of the blood and are accordingly quickly discharged from the body, have a diuretic action. Substances which irritate the kidneys act in small amount as stimulants to their function; for example, oil of turpentine, oil of juniper, cantharides, caffeine, diuretin. Substances which increase the force of the heart, and consequently the pressure of the blood, act under certain circumstances in this way also; for example, digitalis, strophanthus, squill, infusion of broom-tops.

Diuretics are given sometimes, as in cases of dropsy, to diminish the quantity of fluid in the blood and indirectly in the whole body; at other times with the view of removing waste solid matter in solution. In the former case, substances of the digitalis group are given if the dropsy be dependent on heart disease, while dropsy originating from kidney trouble is variously treated according to circumstances. In febrile conditions, and in cases where there is a tendency to the deposit of uric acid or to the accumulation of other waste products in the system, those diuretics which render the urine more watery, particularly the saline diuretics, are administered.

Dandelion, or **Taraxacum**, is a very old remedy for dyspepsia associated with torpidity of the liver. An extract and a fluidextract are prepared from the fresh leaves and roots, and used as ingredients of pills or tonic mixtures. The fresh milky juice of the flower-stalks is also sometimes used as a remedy for warts, several applications being necessary.

Dandelion

Marsh-mallow.—This is found plentifully throughout the United States, growing along the banks of rivers and in marshy places. Its mucilaginous root is a very commonly used emollient and demulcent, and is valuable in diseases attended with irritation and pain, especially of the urinary organs. It has been found to relax the passages in nephritic complaints, in which latter case a decoction is the best preparation. Two or three ounces of the fresh roots may be boiled in a quart of water, to which one ounce of gum arabic may be added.

Diluents are watery fluids of an unirritating nature, which are given to increase the amount of perspiration or of urine, and carry solids with them from the system. Examples are water, milk, barley-water, and solutions of alkaline salts.

Elder.—This shrub is found growing in all parts of the United States, especially in hedges. It acts as a laxative and stimulates

the urinary organs. The bark is useful in dropsy. An ointment is made from the leaves which is very useful in skin eruptions. A tea made from the leaves is good to stimulate the liver in children.

Emmenagogues are drugs which restore the flow at the menstrual periods, when this is scanty or absent. Certain substances, which are mainly dangerous irritant poisons, are credited

Elder

with the power of producing this effect, by causing congestion in the blood-vessels of the womb as they do in those of the bowels. Other substances act indirectly by removing the state of ill health to which the failure is due, such as iron in anemia, salicine for rheumatism, etc.

Emulsions are mixtures containing oily substances in a state of very fine division. The division is effected and the oil kept suspended in the fluid by means of alkalies and sticky ingredients such as albumen, glycerine, or mucilage. Milk is an example of a very perfect emulsion of fat-globules each surrounded by an envelope of albumen. The various preparations of cod-liver oil are usually emulsified by the aid of glycerine. The oil is not only rendered more devoid of taste, but digestion and absorption are also rendered easier by emulsification.

Ether, or ethyl oxide, is a colorless, volatile, highly inflammable liquid formed by the action of sulphuric acid upon alcohol, with the aid of heat. Ether boils below the body temperature, and so when sprayed over the skin rapidly evaporates. It dissolves many substances, such as fats, oils, resins, better than alcohol or water, and is accordingly used in the preparation of many drugs. Externally it is used as a cleansing agent before operations, because, dissolving as it does the fat from the small cracks and entrances to the hair follicles, it renders the surface more accessible to water. It has also been used externally as a freezing agent to abolish sensation for small operations, though in this respect its place is now taken by ethyl chloride. By inhalation it is used as a general anesthetic. Internally it is used occasionally for relieving pain such as colic, and also for its stimulating properties. In cases of heart-failure and collapse from other causes half a dram to a dram is often injected hypodermically.

Elecampane

Elecampane.—This tall herb grows in Europe and also in the meadows of the United States. Its mucilaginous root acts as a general tonic and pulmonary

antiseptic, being recommended in consumption, especially in combination with other drugs. It is made as a decoction, and sugar added.

Ethyl Bromide and **Ethyl Chloride** are clear, colorless liquids, produced respectively by the action of hydrobromic and hydrochloric acids upon alcohol. Both are extremely volatile, and rapidly produce freezing of the surface when sprayed upon it. Accordingly they are used to produce insensibility to pain for small and short operations. Ethyl chloride is put up in graduated glass or metal tubes, with a fine nozzle, under the name of kelene. The tube is warmed by the hand, and the liquid jets out in a fine spray. They are also used singly or mixed to produce general anesthesia by inhalation. This effect they induce in a few moments, and sensation returns after their discontinuance in an equally short space of time. They are supposed to be very safe, and are used for brief operations like removing teeth or tonsils.

Eucaine is a substance closely resembling cocaine both in chemical composition and in action upon the body, but, while cocaine is extracted from a plant, eucaine is a laboratory production. It has two advantages over cocaine: it can be boiled, and so sterilized for injection, without being destroyed, and, what is of more importance, it has much less depressant action upon the heart, in large doses, than cocaine. Otherwise what has been said of cocaine is generally true of eucaine.

Emollients are substances which have a softening and soothing effect upon the tissues of the body. A combination of warmth and moisture, such as that presented by poultices of oatmeal, starch, bread, or linseed, has the greatest softening effect upon skin surfaces. Ointments, soap, and glycerine also act in this way, as do also albuminous and gummy substances like white of egg, isinglass, and mucilage of acacia. They are used in various inflammatory conditions such as eczema, when the surface becomes hard, cracked, and painful; to protect abraded mucous membranes, for instance, glycerine to the mouth, isinglass in milk for the stomach or bowels in inflammation of these organs; also in conditions where it is desired to hurry on inflammatory or absorptive changes, for example, by poultices to the skin over an abscess which is slow in showing signs of bursting.

Water Fennel. — This plant grows plentifully all over Europe. It has been found also in the marshy lands of the United States. An essential oil is obtained from this plant which can be given to children for intestinal trouble. An infusion is recommended for the relief of gas on the stomach.

Water Fennel

Formalin, or formic aldehyde, is a gaseous body prepared by the oxidation of methyl alcohol. For commercial purposes it is prepared as a solution of forty-per-cent. strength in water. It is also compounded with gelatine to form a dry powder known as glutol. Euformol is a preparation in which formalin is mixed with eucalyptus, gaultheria, menthol, and boric acid, in order to lessen its pungent smell. Formalin is a powerful antiseptic, and has also the power of hardening the tissues. The vapor is very irritating to the eyes and nose. For disinfection it is largely used instead of sulphur when fumigation is desired, since it is said to be more effective than sulphurous acid gas, and it is certainly less destructive to metalwork, curtains, and carpets. In a one-per-cent. solution in water it forms a powerful antiseptic for hand-washing, and has the merit of being non-poisonous in small amounts. Glutol is used as a dusting powder for ulcers and burns. Formamint lozenges are useful for inflammation of the throat.

Formic Acid, a substance originally introduced into medicine because of its presence in the bodies of ants, which possess enormous muscular power, is used as a muscle and nerve tonic. It

has been given with success in cases of cardiac weakness and of various tremors.

Ginger

Ginger.—The zingiber, or ginger plant, is found especially in central Europe, but of late it has been cultivated in the southern part of the United States. It is recommended as an aromatic tonic. The main action of this drug is on the stomach, as it increases the flow of gastric juice. Make an infusion of the root and drink as hot as possible.

Gelsemium is the root of the yellow jasmine, a climbing plant of the southern United States. Its action upon the body is to paralyze the central nervous system. Accordingly, in painful or spasmodic conditions, especially those associated with the head, such as neuralgia, headache, migraine, and eye-strain, it gives relief in small doses. It must be used with caution, because in larger doses it is a dangerous poison, causing languor, muscular weakness, paralysis of the face muscles, rapid and feeble action of the heart, and finally gradual stoppage of breathing. It is generally used for neuralgia, headache, etc., in the form of tincture of gelsemium combined with various other drugs.

Guaiac is a resin obtained from the wood of lignum-vitæ, a West Indian tree. It is largely used in rheumatism and in acute tonsilitis in the form either of the tincture or the ammoniated tincture of guaiac. These are generally taken in warm milk in doses of about a teaspoonful. Guaiac lozenges are very useful when sucked by persons suffering from incipient tonsilitis, and will often cut short a threatened attack of this form of inflammation.

Guaiacol is a light-colored, yellowish fluid of pleasant smell, obtained from beechwood creosote, of which it forms sixty to ninety per cent. Its use is mainly restricted to the treatment of consumption, partly because it is supposed to stay the action of the poisons produced by the tubercle bacilli, partly because it reduces feverishness. It may be given in spirits or in cod-liver oil in the same doses as creosote, or it may be inhaled from a jug of hot water, but it seems to act most powerfully when painted on the skin and covered over with oil-silk to aid absorption.

Carbonate of guaiacol, a white, crystalline powder, has been used for the same purpose, administered by the mouth.

Golden-seal.—This herb grows mostly along the banks of rivers and in shady woods and deep valleys. Its root forms a tonic and at the same time a laxative, which makes it very appropriate in dyspeptic disorders. It is employed chiefly in bitter tonics.

Golden-seal

Hoffmann's Anodyne is a popular name for both spirit of ether and compound spirit of ether. The former is a mixture of alcohol and ether, the latter contains in addition oil of wine. Both are used to relieve pain and spasm, the chief part of their action being due to the ether they contain. The dose is a teaspoonful taken in cold water.

Holocaine is a substance allied to phenacetine and possessed of an action somewhat similar to that of cocaine.

Homatropine is an artificial alkaloid prepared from atropine. Its sole use is to dilate the pupil of the eye in ophthalmic work, when it is desirable to examine the eye carefully without impairing the vision for any length of time. It is preferred to

atropine, because, while the effect caused by the latter will persist for several days, the inconvenience which is caused by the use of homatropine lasts little more than one day.

Black Hellebore

Hellebore. — This is occasionally found among the mountains of the United States, but most of it comes from Europe. The plant blooms late in the fall and has purple flowers. It has been recommended as an alterative or tonic, but it has a definite action in starting a case of obstructed menses. The root is boiled with water and strained for use.

Hemlock.—This tree grows plentifully throughout the northern part of the United States. A decoction of its bark and leaves makes an excellent astringent wash for falling of the bowel and womb. It has been used in rheumatism to induce perspiration. The oil is used externally to relieve muscular pains, and has been employed in plasters for sciatica.

Peruvian Bark is the bark of the cinchona tree, which is found mostly in South America. There are two varieties, red and yellow. It yields the most valuable drug we have for chills and fever. It has been found especially valuable for malaria, and may be given in the form of the alcoholic tincture or else the productive extract called quinine. The sulphate of quinine should be given in five-grain doses every four hours.

Garden Nightshade.—A native plant of Europe, and naturalized in this country, especially along roads. It is used as a narcotic, and may be taken internally or applied externally. If used in a strong solution, it will remove the upper layer of the skin.

Garden Nightshade

Glycerine is a clear, colorless, thick liquid of sweet taste, obtained by decomposition and distillation of fats. It dissolves many substances, and it has a great power of absorbing water, in consequence of which, in the pure state, it irritates surfaces with which it is brought in contact. Glycerine has many varied uses. Numerous substances, such as carbolic acid, tannic acid, alum, borax, boric acid, and starch, are dissolved in it for application to the body. Mixed with an equal quantity of water it forms a useful mouth-wash when the tongue and gums are furred or dry, and is useful for application to the skin in order to prevent chapping in cold weather, and to protect and heal all sorts of small abrasions.

Internally, pure glycerine in doses of one or two teaspoonfuls acts as a purgative, administered either by the mouth or as an injection. For its pleasant taste it is added to various medicines, and to the food of diabetics.

Gray Powder is composed of mercury and chalk, which is used for administration to young children in cases where the use of mercury seems desirable. It is much used as an ingredient of powders intended to check the infantile diarrhea which results from conditions of fermentation within the bowels. To children it is generally given in doses of one grain, or less if repeated.

Hypnotics are measures which produce sleep. Of the pure hypnotics, which dull the brain without much other effect, the chief are chloral hydrate, chloralamide, bromides, sulphonal,

trional, veronal, paraldehyde, hyoscine. Simple remedies should always receive a fair trial first of all. Thus a person may be kept awake by an overfilled state of the vessels of the brain, due to severe mental labor or worry just before retiring to rest. The activity of the brain continues and sleeplessness results. Some quiet employment for the latter part of the evening or a light meal may relieve this. The precisely opposite condition of anemia of the brain occurs in old men whose arteries are unhealthy, and this also debars sleep, unless the head be kept warm or a small quantity of alcohol be taken at bedtime. Occasionally sleep can be obtained by purely external applications. Massage of the head, the wet-pack, and electrical applications are all made use of in different cases. A condition of anemia and discomfort together, in heart-cases, may ward off sleep, though the sick person be very tired, and in such a case the best hypnotic is perhaps paraldehyde. For delirium and the sleeplessness of fever, hyoscine, chloral hydrate, and chloralamide are generally employed, and for sleeplessness with no assignable cause, veronal, trional, or sulphonal is perhaps best, and is not attended by the risk of starting a habit which is hard to break.

Henbane

Henbane.—This poisonous plant is a native of Europe, but grows plentifully along the roads of the United States. It acts as a narcotic, both externally and internally. It is used for all painful swellings, and is valuable for piles and skin eruptions.

Hydrochloric Acid is a gas which, dissolved in water, forms a clear, colorless fluid of sour taste and smell. It is present in the gastric juice to the extent of 2 parts in 1000. In large quantities it is a corrosive poison. Its

chief use is in cases where the gastric juice is deficient, for example, in alcoholic catarrh of the stomach, in gastric cancer, and in some other forms of indigestion. Dilute hydrochloric acid is generally given along with a bitter infusion in doses of ten or twenty drops.

Hoarhound.—This herb of the mint family is a native plant of Europe, but flourishes well in the United States, growing along the roadside. It is valuable as an expectorant and tonic, and is good for persistent coughs and pulmonary affections. It may be given as an infusion or syrup for coughs.

Hoarhound

Hypodermic administration of drugs is a method now largely employed, both because drugs act much more rapidly when so injected, and because the dose can be calculated with more nicety than when the drugs are given by the mouth and slowly absorbed from the stomach. The greatest care must be taken prior to making an injection that both the surface of the skin and the needle are absolutely clean, otherwise bacteria may be introduced into the tissues, and abscesses result. The skin is best purified by soap and water, followed by rubbing with tincture of iodine or ether; the needle is easily purified by boiling. Most drugs are obtainable in the form of small, easily soluble tablets. A tablet is placed in the syringe, or dissolved first in water in a clean teaspoon; the needle is fixed on the syringe, which is then filled with the fluid to be used. With a little shaking the tablet dissolves, and the syringe is then held needle upward and the piston pressed gently up the barrel till a few drops of fluid run out of the point of the needle, expelling the last air-bubble before them. The skin is pinched up between thumb and forefinger to form a fold into which the needle is obliquely passed, or preferably the needle is plunged straight into the underlying muscle. The piston is then gradually pressed home.

The dose of a powerful drug must be smaller when given hypodermically than when administered by the mouth, and care must be taken not to inject the contents of the syringe into a large vein, unless in smaller quantity, for then the drug produces a more sudden and powerful effect. Great care must also be taken that the syringe and its needle are absolutely clean, and a glass syringe with a tightly fitting ground-glass or metal piston is best. But the chief danger is not connected with the injection, but with the fact that persons using a drug like cocaine or morphine may be very apt to contract a habit of using these drugs. On this account, a person should never be permitted, under any circumstances whatever, to administer a hypodermic injection of any powerful drug to himself or herself.

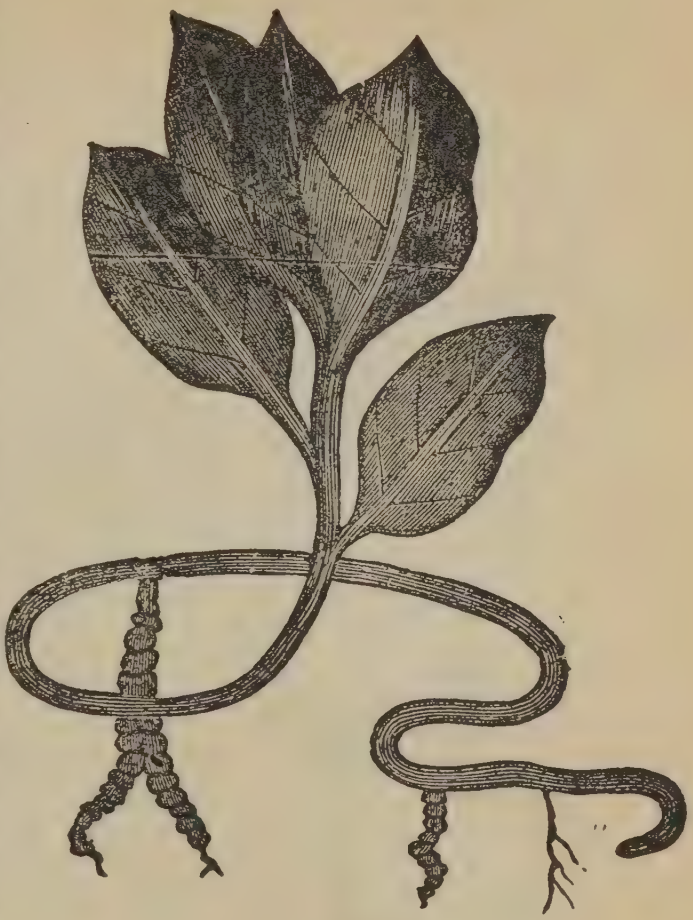
Hops

Hops.—The hop plant is found in the gardens all over this country. The tincture relieves pain in a short time, and is very good for after-pains and especially in cases where opium cannot be taken. It has been used as a fomentation to relieve pain in the bowels and in the head, and is a good sedative after severe shock.

Ichthyol, a dark, brown, thick liquid of offensive smell, is remarkable both for its source and for the benefit that attends its use in several diseases. It is prepared by distillation from a deposit of fossil fish in the Tyrol. It is used in several chronic skin diseases, and also to diminish inflammatory conditions round the womb. Perhaps its most successful use is, in twenty-

per-cent. strength mixed in glycerine, to smear over areas of skin which are the seat of erysipelas.

Ipecac. — This plant grows plentifully in South America. It is valuable as an emetic because there is no distress afterward. In small doses it acts as a tonic, strengthening the digestive organs, and is useful in liver complaints. It is useful also in fevers to keep the blood at the surface. The powdered root may be given in molasses. The syrup of ipecac is valuable as a cough mixture for children, especially for croup.



Ipecac

Infusions are preparations of vegetable drugs made by steeping them for some time in water and straining. In order that an infusion may keep well it is usually concentrated and mixed with alcohol, being diluted just before it is dispensed. Among the better-known infusions are those of calumba, chiretta, cinchona, digitalis, gentian, orange, rhatany, quassia, roses, senega, and senna. The dose of any infusion is from one to several tablespoonfuls, except infusion of digitalis, of which only one to two dessertspoonfuls are taken at one time on account of its action on the heart.

Decoction is the name for a preparation made by boiling various plants in water and straining the fluid. Examples are decoction of broom-tops, of cinchona, and of sarsaparilla. The dose of any decoction is from one to several tablespoonfuls.

American Ipecac

American Ipecac.—This plant is a native of America, growing in shady woods, especially in the Southern States. Its root is used as an emetic and tonic. It is useful in eliminating water from the system, especially when other drugs have failed. It also promotes the menses and gives relief in colic.

Iodine is a non-metallic element which is found largely in seaweed. It has a pleasantly pungent smell and a burning taste. It has a highly irritating action, and, when applied to the skin, stains the latter dark brown and causes it to peel off in flakes, while internally it is a violent irritant poison. It is much used as an irritant. For this purpose it is dissolved in alcohol, forming tincture of iodine, or in water containing iodide of potassium, which renders the iodine more soluble, or is made up into iodine ointment. It is very frequently used to paint enlarged glands, in order to bring about decrease in size. It is painted over the chest in cases of pleurisy to bring about absorption of the pleuritic effusion, and when pain due to this cause appears over the chest in chronic

consumption, iodine is one of the best remedies. It is a useful preventive of chilblains, applied while the hands are still red before they have begun to crack. For chronic inflammation of bones, joints, and bursæ it is also very largely used.

Tincture of iodine (two and a half per cent.)or alcoholic solution of five per cent. is used to sterilize the skin before operations. The tincture forms one of the best antiseptics, painted on copiously, to cleanse and dress dirty wounds on work-soiled hands or other parts.

Indian Turnip.—This common herb grows all over the United States. It is called "dragon root" and "jack-in-the-pulpit," and is found as a three-leaved plant with berries of a bright scarlet color. When fresh the root is a powerfully strong stimulant. It makes an excellent poultice for swollen glands of the neck. When dried and pulverized, it is a good remedy for coughs and pains in the breasts. When made into a decoction and given in teaspoonful doses, it will be found a valuable remedy for colic. Some recommend it for typhus fever. When made up in an ointment with lard it is a good remedy for eczema of the scalp.

Indian Turnip

Inoculation is the process by which infective material is brought into the system through a small wound in the skin or in a mucous membrane. Many infectious diseases and blood-poisoning are contracted by accidental inoculation of microbes. Inoculation may also be done as a preventive measure against disease; for example, prior to the introduction of vaccination persons were inoculated with an emulsion made of the crusts from smallpox patients, in order to produce a mild form of the disease, and thus gain protection against later severe attacks.

Iodoform is a crystalline substance made by the action of iodine upon a mixture of alcohol and potash. It has a most penetrating, rather pleasant odor and strong taste. It is insoluble in water, but dissolves in alcohol, ether, and oils. It relieves pain when applied to a raw or mucous surface, and has the property of preventing putrefaction when brought in contact with discharges. When applied in large quantities to a raw surface it is apt to be absorbed and to cause symptoms of poisoning, consisting of a red rash over the body, fever, loss of appetite, and, it may be, delirium. Iodoform is mainly used in surgery to apply to ulcers and discharging wounds, particularly those of either a tubercular or venereal nature. Dissolved in oil or glycerine, it is much used to inject into tubercular abscesses and joints, producing often a cure of the disease without recourse to a serious operation.

Jalap

Jalap is obtained from a tropical herb that grows in Mexico and a few of the Southern States. The cold climate kills it quickly. The root of this plant is a brisk cathartic, acting in a remarkably efficacious manner, without griping, on the entire alimentary tract. It is given with other drugs for biliousness. It is also used in dropsy because it takes a large amount of water from the bowels.

White Pine.—Found plentifully in the northern and southern parts of the United States. The bark of this tree has been found valuable in coughs, for urinary troubles, and as a stimulant. It has been used for years in consumption and chronic rheumatism. It helps the flow of the menses and is beneficial for diseases of the kidneys.

Wild Cherry.—This tree is abundant throughout the western part of the United States. The bark yields a bitter tonic for the stomach and also for intermittent fevers. Together with other drugs, it is used as a blood purifier.

Indian Hemp.—It is found in the meadows and moist woods of the United States. The stems stand several feet high, with white flowers. The root has been used with success in dropsy. Add one quart of water to one ounce of the root and boil this down to one pint. The dose is a tablespoonful three or four times a day. It is somewhat laxative in action and is used for indigestion with bitter tonics.

Juniper.—This shrub is found along the rivers of the New England States. It is also found in the central part of Europe. The berries yield a drug which acts on the urinary organs. It also acts as a stimulant and tones up the whole system. The oil extracted from the berries may be used, or an infusion can be given. The dose of the oil is three drops.

Juniper

Jaborandi is the leaf of a South American plant. It contains an alkaloid, pilocarpine, upon which its action depends. When taken internally, pilocarpine causes a flushing of the skin, followed by profuse perspiration, commencing upon the face and neck and later spreading over the whole body. It also causes a great flow of saliva. In larger doses, it slows the pulse and weakens the heart's action. It is mainly administered to people who are the subject of acute Bright's disease, in order to increase the action of the skin and so reduce dropsy and prevent poisoning by the products which the kidneys are failing to excrete. Pilocarpine is also used in several skin diseases; and as a remedy for baldness, infusion of jaborandi forms the chief constituent of many vaunted hair-washes.

Lobelia.—This pretty plant grows all over the fields and woods of the United States. The flowers give out a milky juice, which causes marked vomiting and occasionally endangers

Lobelia

life. It is best given with drugs which modify its action. It is good for asthmatic cases which have been found to resist other drugs, and in some cases of whooping-cough it has been of value.

Lactic Acid Bacilli have been introduced by Metchnikoff to prepare milk as a special article of diet, similar to kumiss. The bacilli, which are issued in various forms, as tablets, in fluid, etc., are added to fresh milk, allowed to act upon it for several hours in a warm place (according to the degree of sourness desired), and the milk is then consumed with the active bacilli. These, after a course of such treatment, come to replace the bacteria naturally found in the intestines, and are supposed to be less injurious to the system. While the idea with which they were introduced, of increasing longevity, is fanciful, sour milk forms a healthy article of diet; and the bacilli, which are harmless, have, in some cases of intestinal disease, a highly beneficial action. Buttermilk has a similar effect.

Lithium is a metal of which the carbonate and citrate are frequently used in medicine, as well as other salts to a smaller extent. These salts form soluble compounds with uric acid and urate of soda, and therefore they are credited not only with being able to ward off attacks of gout, but with a certain amount of power in reducing the size of chalk-stones and other gouty deposits and in dissolving uratic stones deposited in kidney or bladder. Probably their action in this particular is greatly overestimated, and more benefit is derived from the large quantities of water in which they are taken than from the lithium itself. When these salts are taken they must be continued for some time in order to produce any result, and about five grains of either are taken three times a day. There is also an effervescent citrate

of lithium, of which one or more teaspoonfuls are mixed with a tumblerful of water.

Lady's-slipper.—This orchid-like plant is common on the hills and in the swamps of New York State, and is found throughout the United States, being commonly called nerve-root. Lady's-slipper root is a sedative and nerve tonic and has been found valuable as a substitute for valerian. It is usually taken in the form of a tincture, the dose being one tablespoonful.

Lady's-slipper

Lead has no action itself upon the system, but its salts, when absorbed in any quantity, or for any length of time, have very important effects. When a lead salt comes in contact with a wound or with any mucous surface, it combines with the albuminous material of the discharge or secretion to form a whitish glaze, which affords a great degree of protection to the surface. Further, the lead salt has an astringent action upon the blood-vessels, and therefore helps to stop bleeding or relieve the congestion of inflammation. If one of the soluble lead salts be taken internally, in large amount, it has an irritant action, and the acetate (sugar of lead), subacetate, and nitrate of lead are irritant poisons when taken into the stomach, though their poisonous action is comparatively feeble.

In eczema, this solution sponged upon the affected area often gives relief from itching. Liniment of subacetate of lead and glycerine of subacetate of lead are similarly used. Litharge or oxide of lead is used as a basis for many adhesive plasters, which are known as diachylon plasters. Internally, the main use of acetate of lead is to check diarrhea, and the favorite form in which it is used for this purpose is in lead and opium pill. It is also used, in suppositories, for bleeding piles.

Liverwort

Liverwort.—This plant is a native of the northern parts of Europe, Asia, and America. It is also found among the mountains of the United States. It is used as a mild astringent and expectorant. It may be administered in fevers, liver complaints, and indigestion. A decoction has been found good for bleeding of the lungs. A syrup will be found valuable for a hacking cough.

Mercury, also known as quicksilver, or hydrargyrum, is a heavy fluid metal. In medicine, the metal is used in a state of fine subdivision in the form of an ointment, a plaster, gray powder, and blue pill. Mercury itself is, however, an inert substance, and its effect upon the body is probably the result of the action of the secretions upon it, which convert it into some of its powerful salts. The salts of mercury fall into two groups: the mercuric salts, which are very soluble and powerful in action; and the mercurous salts, which are less soluble and act more slowly and mildly. The mercuric salts are all highly poisonous both to man and to bacterial life, so that they are strongly antiseptic. In strong solutions, several act as caustics, and in weaker solutions they are irritants. Taken internally, the first effect of the mercuric, and to a less degree of the mercurous, salts, is by their irritating action to set up copious purging. They are also credited, particularly perchloride of mercury and blue pill, with the power of increasing the flow of bile, and for this reason are much used as purgatives. They are absorbed into the body in the form of a compound, either with albumin or with the chlorides of the blood and lymph, and, in certain diseased conditions, exert a powerful effect upon the health.

Particularly is this the case in the early stages of syphilis, for which mercurial salts form the remedy *par excellence.*

Externally the great use of the mercuric salts is as disinfectants and antiseptics. The ammoniated mercury ointment, or white precipitate ointment, is much used to apply to the contagious eczematous condition which appears on the head and face of children, known as impetigo. The yellow oxide of mercury ointment is very widely used for an application to the eyelids, when a mild antiseptic ointment is required. Internally, mercurial salts are frequently used as purges; and for persons who cannot take castor-oil, calomel forms one of the most convenient drugs, producing much the same effect as the oil, if three or four grains be given to an adult. Blue pill and gray powder are used in the same way, and in about the same dose. All of these are best taken at night, and followed by a dose of Epsom salts in the morning.

Mandrake.—It is found in woods and patches throughout the United States, and its root is used as a purgative and hydrogogue. It is a sure and active cathartic, considered better than jalap in some diseases. It has been found valuable in all liver affections and dropsy. If too large a dose is

Mandrake

given, it may produce vomiting. In many cases it stimulates the menses.

Menthol is a white crystalline substance deposited from oil of peppermint when it is cooled. It comes principally from Japan. It dissolves freely in alcohol, ether, chloroform, and olive-oil, and also to a slight extent in water, to which it gives a strong odor and taste of peppermint. Mixed with a little oil of peppermint, it can be molded into cones, sticks, or pencils, which are very widely used. When menthol is rubbed up with thymol, carbolic acid, chloral, or camphor, the two solids form a clear oily liquid, which can be painted on the skin, exerting the effects of both drugs. Applied to the skin, menthol has weak antiseptic properties, and it acts upon the sensory nerves something like aconite, causing first a hot, tingling sensation, followed quickly by a cool, numb feeling. When applied to inflamed mucous membranes, such as those of the nose and throat, menthol relieves irritability, diminishes congestion, and checks excessive secretion. Menthol has the great merit of being non-poisonous. In neuralgia, the cones and sticks of menthol are widely used to rub over the affected part. In toothache, absorbent cotton dipped in one of the oily fluids above named and placed in the cavity of the decayed tooth, quickly relieves the pain. In many itchy conditions of the skin, a strong solution of menthol in olive-oil (1 part to 10) relieves the sense of irritation at once. Menthol plaster is useful in gout, rheumatism, and neuralgia, and so are mixtures with chloral or camphor painted over the painful parts. For inflamed conditions of the nose and throat, the oily compounds of menthol are diluted with parolene and sprayed on the part affected, or in the case of the throat various lozenges and pastilles containing menthol are sucked. In bronchitis, both in early stages and when there is much secretion, menthol crystals thrown upon hot water, from which the vapor is inhaled, give much relief.

Mullein.—This plant is found abundantly along the roads of England, and of late it has been cultivated in the southern part of the United States. It is recommended for the relief of pain and also for pulmonary disorders. A decoction of the leaves is said to be valuable for spitting of blood. Externally, the leaves have been used as a poultice to relieve inflammation.

Mindererus Spirit is an old name for *liquor ammonii acetatis,* a solution of ammonium acetate, which acts as a diuretic, and is much used in domestic medicine. It is a harmless substance, and is said to be used by the Russian peasantry as a condiment for food, in place of common salt. The usual dose of Mindererus spirit is a dessertspoonful or more, for colds and slight feverish conditions.

Mullein

Myrrh is a gum-resin obtained from an Arabian myrtle tree. It stimulates the functions of mucous membranes with which it is brought in contact or by which it is excreted. Tincture of myrrh is used for a gargle in sore throat, as a tooth-wash when the gums are inflamed, and as an ingredient of cough mixtures. Myrrh is also used with purgatives, especially in anemia.

Liniments, or embrocations, are preparations intended for external application, generally with rubbing. Almost all are of an oily nature, and are highly poisonous, being dispensed therefore in green or blue bottles. Liniments should never be kept alongside medicines intended for internal use, because many fatalities occur through carelessness of administration, a dose being poured out of the wrong bottle. Among the chief liniments are aconite, belladonna, and chloroform liniments, often mixed together in equal parts to form A.B.C. liniment, which is extensively used for neuralgia, rheumatism, and other painful conditions; linimentum calcis, or carron-oil, used for burns; iodine liniment, used to paint over enlarged glands, swollen joints, etc.; opium liniment, used to apply in various acutely painful conditions; turpentine and acetic turpentine liniments, used especially for sprains, bruises, and rheumatic conditions; liniment of ammonia, popularly known as hartshorn and oil, used for the same purposes; and soap liniment, known also as opodeldoc, of like application.

Manna

Manna. — The manna ash is a native of the south of Europe, particularly Sicily and southern Italy. It secretes a sweet juice which constitutes a very mild purgative. When gathered fresh it contains a sugar, but by age this is changed; it then becomes a laxative. It may be given in milk; or if combined with other drugs, it may be given for worms.

Malignant is a term applied in several ways to serious disorders. Tumors are called maligant when they grow rapidly, tend to infiltrate surrounding healthy tissues, and to spread to distant parts of the body, leading eventually to death. The term is also applied to types of disease which are much more serious than the usual form, such as malignant scarlatina, malignant smallpox, etc., the disease in these cases generally resulting in death. Malignant pustule is another name for anthrax.

Malt is a substance derived from barley by allowing a certain amount of growth to take place in the moistened grain, which is then dried and crushed. It contains an albuminoid ferment named diastase, together with a large amount of malt-sugar and dextrine, the latter constituents being still further developed from the starch of the barley by the action of the ferment, when

the malt is allowed to digest in water at a temperature approaching 104° F. Similarly, the ferment will convert into sugar a large amount of the starch in flour mixed with malt, and so perform the functions of the saliva and pancreatic juice. For these reasons malt is mixed with various proportions of flour to form the popular foods for children.

Various proprietary forms of malt extracts are prepared under such names as "maltine," "bynin," etc., all consisting mainly of malt-sugar, dextrine, and more or less diastatic ferment. They are also prepared in mixtures with drugs, such as iron, cod-liver oil, and strychnine.

Taka-diastase is a Japanese preparation of still stronger sugar-forming power than malt-diastase, produced by the cultivation of a fungus on bran.

Malt and its various extracts, being very palatable and of high nutritive value, are used in debilitating conditions of different natures, combined with various other foods and tonics. The extracts are also of value in the case of persons of feeble digestive power when given along with such foods as oatmeal, gruel, bread and milk, or arrowroot, and the malt must be added after the food has begun to cool, as boiling destroys its starch-converting power. The dose of powdered malt and of its various extracts is one or more teaspoonfuls.

Mustard. — This plant is grown throughout Europe and Africa for its seeds, which are converted into the common flour of mustard. It is a valuble stimulant and is also used as an irritant to the skin. Used in the form of a poultice it is excellent in relieving superficial and deep inflamma-

Mustard

tion. In unconscious conditions it is used to draw the blood to the surface.

Nitrate of Silver, also known as lunar caustic, is a heavy crystalline salt of silver, very soluble in water, and generally prepared in sticks. In weak solution it has a strong astringent action, and in the pure form it acts as a powerful caustic. It is very slowly discharged from the system, and, if used for any great length of time, it is apt to produce a brown discoloration of the skin all over the body, known as argyria. Locally it is used as a caustic, acting painlessly on warts, etc. As an astringent it is used in many inflammatory conditions of mucous membranes, in the form of gargles, sprays, and douches.

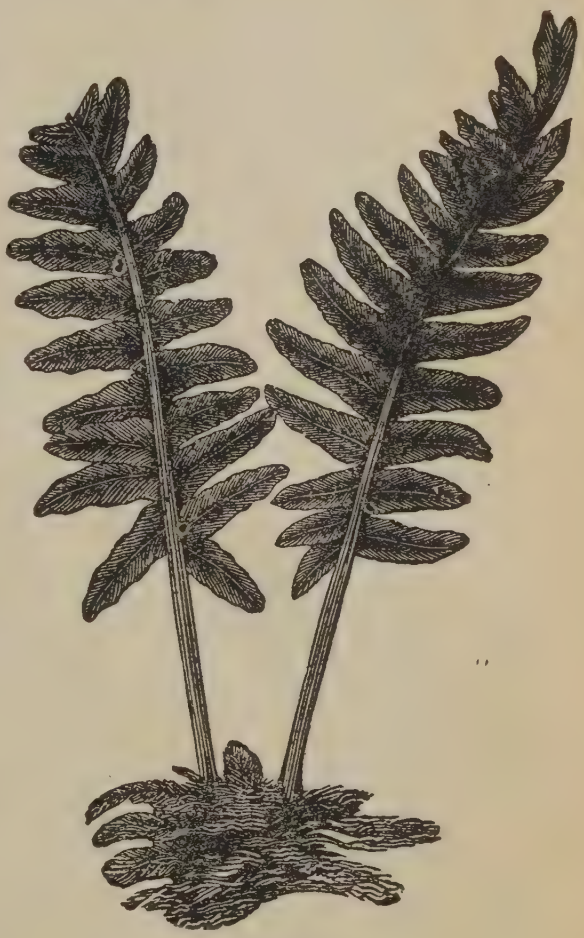
Nutmeg

Nutmeg.—The nutmeg tree is found in large quantities in the West Indies. Of late it has been cultivated in the southern part of the United States. The kernel of its seed forms the nutmeg of commerce. It is recommended as a tonic and stomachic. Its action is due to the presence of an essential oil, which, in small doses, tones up the stomach by increasing the secretions. Externally, the oil has been used to relieve the pain of sciatica and neuralgia.

Male-fern. — This fern is mostly found in Great Britain, but of late has been grown in the United States. It is called aspidium in this country, and the fruit is kidney-shaped, with large oval leaves. Its

root appears to be highly deleterious to intestinal worms, and particularly to the tapeworm. There is much evidence that it kills the worm, and it forms the basis of all worm remedies. It is most conveniently given in the form of an oil, half a teaspoonful in sweetened water or molasses at night, followed with a dose of castor-oil in the morning. A very light diet is advisable before taking the treatment.

Polypody.—This is a very common fern, found on mountains and rocks throughout the United States, especially up north. It is used as an expectorant and purgative. A syrup made from this plant is good for lung diseases. A strong decoction given to children will expel worms. The root, given with other drugs, is used to purify the blood.



Polypody

Silkweed or **Milkweed.**—This grows plentifully throughout the United States, especially in sandy grounds. It is a tall plant with a yellow flower and milky leaves. The drug contained in its root acts especially on the urinary organs. Boil an ounce of the root in a pint of water, and strain; it is then ready for use. As the drug is very bitter, sugar may be added. It has proved very beneficial in all cases of dropsy.

Niter, also known as saltpeter, nitrate of potassium, and, in the form of sticks, as sal prunella, is a crystalline substance of a sharp saline taste, found native in India, Persia, and other

places. It is very irritating to the stomach and is not now used internally, but is of great use for inhalation in the treatment of asthma, since the nitrate in burning gives off nitrites. Two and a half ounces of the saltpeter are dissolved in a tumblerful of water, and squares of thin white blotting-paper about six inches in diameter are dipped in this brine and then allowed to dry. When used they are folded like a tent, set on a plate, and lighted at the edges. Several of these burned in the room of a person suffering from asthma generally give speedy relief.

Nitric Acid is one of the strongest of the mineral acids, and is a clear, heavy liquid, becoming brownish with age. It is kept in dark, glass-stoppered bottles, and immediately the stopper is removed from the bottle irritating white fumes are given off. In its pure state nitric acid acts as a powerful caustic upon the tissues of the body, which it turns a bright yellow color. In weaker solution, it is, like all acids, an antiseptic, but is very irritating. Internally, in small doses it has a stimulating action upon the gastric mucous membrane. Nitric acid is one of the most effective caustics for warts, and is also used as a powerful antiseptic and caustic for destroying foul ulcers which threaten to spread, leaving clean ulcers in their place. Internally, the dilute nitric acid is frequently combined with bitters and tonics in cases of dyspepsia with loss of appetite. The dose is ten or twenty drops.

Olive

Nitrites are salts which have a powerful effect in paralyzing the action of involuntary muscle, and they therefore dilate the blood-vessels and check spasm of all sorts. The most commonly used nitrites are nitrite of amyl, of ethyl, and of sodium. Erythrol-tetranitrate and nitroglycerine have a similar action.

Olive.—This tree is a native of the south of Europe and the northern part of Africa. It is cultivated in France and Italy. The oil extracted from its fruit is valuable as a laxative and antiseptic. Taken internally, it operates as a gentle laxative and is useful for inflammation of the bowels. It is also used as a base for ointments. Some recommend it for insect bites.

Nitroglycerine, also known as trinitrine and glonoine, is a thick, oily liquid of sweet taste and powerfully explosive properties. When a small quantity is taken internally, it produces marked effect in about two minutes, relaxing the arteries so as to cause the skin to flush visibly, quickening the pulse, and causing a sense of fullness all over the body and throbbing in the head. It greatly lessens the blood-pressure, and temporarily relaxes all muscle, whether striped or unstriped. This sudden action in relaxing muscle-fibers and lessening blood-pressure proves very valuable in conditions where serious effects are produced by spasm. For example, in angina pectoris, in bronchial asthma (due in part to spasm of the small bronchial tubes), in gall-stone and renal colic, and in the vomiting of sea-sickness, it diminishes the spasmodic condition and gives relief. In cases of chronic Bright's disease, the slackening of blood-tension has the effect of relieving the strain on the heart, and of diminishing the escape of albumin from the kidneys.

It is used in the form of liquor of trinitrine or spirit of glonoine, of either of which one or two drops are taken in water every few hours; or tablets of nitroglycerine made up with chocolate are carried in the pocket and taken from time to time.

Other substances have a similar action to that of nitroglycerine. Nitrite of sodium and nitrite of potassium are used in doses of three to five grains, and have the advantage of producing their effect more slowly and more permanently. Erythrol-tetranitrate has a similarly prolonged effect. Nitrite of amyl, on the other hand, produces its effect in a few seconds, and, being volatile, may be inhaled as well as swallowed. For this purpose small thin glass perles are prepared, and are carried in the pocket by those liable to angina pectoris or other sudden convulsive seizure. Immediately the spasm comes on one of these perles is crushed between the finger and thumb and held to the nostrils.

Nitrohydrochloric Acid, or aqua regia, so called because of its power to dissolve gold, is a yellow liquid prepared by adding one part of nitric acid to four parts of hydrochloric acid. It is a caustic in its pure state, but is only used for internal administration in a diluted form. It stimulates the gastric secretion like each of its components, and, in addition, is proved to be of special value in increasing the flow of bile, having therefore a considerable use in affections of the liver.

Nitrous Oxide Gas, or **Laughing-gas**, is at ordinary pressures a gas devoid of odor but of a slightly sweetish taste. It is kept under pressure in steel cylinders, from which it can be allowed to escape at any desired rate by turning a stop-cock. Its use in medicine is to produce insensibility to pain, which it does very quickly, and with a great degree of safety, though the effect is of very short duration, not extending beyond two or three minutes. Its use is therefore applicable only for short operations, such as extraction of a tooth, unless it be repeatedly administered in association with oxygen.

Pennyroyal

Pennyroyal.—This plant of the mint family is found all over the United States and in Canada, mostly in dry woods. It is used as a stimulant and carminative. It is a popular remedy to stimulate the menses, and assists nature to restore an evacuation, particularly when it results from a check of perspiration.

Palliative is a term applied to the treatment of incurable diseases, in which the aim is to mitigate the sufferings of the patient, not to effect a cure.

Peroxide of Hydrogen is a syrupy, colorless, odorless liquid. It has the property of readily giving up its extra oxygen and being reduced to water, and this renders it of great value in med-

ïcine for antiseptic, deodorant, and other purposes. It is most commonly employed as a solution in water of such a strength that any quantity will give off ten times its bulk of oxygen gas; this is known as ten-volume strength, or as liquor of hydrogen peroxide. It is also prepared twice and three times this strength. When added to ether, this substance is more stable, and the mixture is known as ozonic ether. Volatile oils which have become oxidized contain a considerable quantity of peroxide of hydrogen, and to this substance the powers they possess of destroying foul odors is largely due. Applied externally to ulcers, and by sprays or swabs to cavities like the nose and throat, the watery solution of hydrogen peroxide acts as an antiseptic, and also causes the separation of discharges. For this reason it is also used in diphtheritic sore throat and in order to remove surgical dressings that are very adherent. It is also used as a hair-dye, having the power of changing hair to a fair yellow shade.

Peppermint.—This herb is native in Europe, but has been cultivated of late in the United States. It is recommended as a stimulant and anti-emetic, and may be given with advantage for colic and vomiting. It has been used as a vehicle for giving bitter drugs on account of its pleasant taste. The dose of essence of peppermint is one teaspoonful. An infusion can also be made from the leaves.

Peppermint

Phosphates are salts of phosphoric acid, and as this substance is contained in many articles of food as well as in bone, the nuclei of cells, and the nervous system, phosphates are constantly excreted in the urine. In certain diseased conditions, such as gout, the amount of phosphates excreted rises above the thirty to fifty grains daily excreted in health, but it is only in diseased conditions of the urinary passages that these give rise to trouble. The forms of phos-

phates appearing in the urine are phosphates of soda and potash, which do not form a sediment, phosphates of calcium and of magnesium, which become insoluble and are deposited if the urine becomes alkaline, and phosphate of magnesium and ammonia combined. The continued use of food containing alkalies, such as green vegetables, and still more the presence in the urine of bacteria which lead to its decomposition, produce the necessary change from the natural mild acidity to alkalinity, and lead to the deposit of phosphates and to their collection into stones.

Podophylline is a resin derived from the root of the May apple, a plant of the United States and Canada. It is a mildly acting purgative in small doses, and is generally combined with euonymin, iridin, and other vegetable extracts which stimulate the liver.

Pinkroot

Pinkroot.—This is a perennial plant of the southern parts of the United States, and is sometimes called worm-grass. It is used to kill intestinal worms and is especially valuable in killing the earthworm. The bark is boiled in water with senna and taken hot.

Potash, or potassa, is the popular name for potassium carbonate. Hydrated oxide of potassium is usually known as caustic potash, and its solution as liquor potassæ. Potash is obtained by burning wood, washing the ashes with water, and evaporating the solution to dryness. The remainder contains from sixty to eighty per cent. of carbonate of potassium, which is used to obtain most of the other salts of potassium.

Potassium is a metal which, on account of its great affinity for other substances, is not found in a pure state in nature. All salts of potassium are supposed to have a depressing effect upon the nervous sys-

tem and upon the heart's action, but in ordinary medicinal doses this action is so slight that it is not of practical importance.

The solid tissues of plants and animals contain a considerable amount of potassium salts, but the fluids of the body, such as the blood, contain sodium salts, and require a constant supply of these for the maintenance of health. Hence the craving which cattle display at times for common salt (sodium chloride), and the necessity for adding this to the human dietary.

When potassium salts are taken in excess, they are rapidly excreted from the body, and thus by stimulating the functions of the kidneys and bowels they increase the amount of urine and act as gentle purgatives. The solubility of potassium salts is greater than that of sodium salts, and therefore it is supposed that uric acid is excreted from the system and kept dissolved in the urine in greater amount when combined with potassium than when combined with sodium, as it usually is in the blood and tissues. For both these reasons it is customary to administer potassium salts to gouty people, and it has even been suggested that these persons should use potassium chloride at table instead of common salt (sodium chloride).

Potassium chlorate, in addition to the general actions exerted by potassium salts, has a specially soothing action upon inflamed mucous membranes, and it is very generally used for a gargle in sore throat.

Plantain.—This familiar weed grows plentifully in the meadows and pastures of the United States. It has long been used to cure insect bites and also as a purifier of the blood. It may be applied externally as an antiseptic, in which case it is made up as a fomentation.

Plantain

Permanganate of Potassium is a crystalline substance of brilliant purple hue. Dissolved in water it has a powerful oxidizing action, in exerting which it disintegrates alkaloidal poisons, all foul and decomposing organic bodies, and kills low forms of life, such as bacteria. It is therefore a powerful antiseptic. It is nonvolatile, and so has not the penetrating power of carbolic acid, and in exerting its oxidizing power it is itself reduced, so that it gradually loses strength.

Permanganate of potassium is a cheap disinfectant, and is most conveniently kept in a saturated solution (1 part of potassium permanganate to 20 parts of water). If this be diluted with water twenty-five times (1 in 500), that is, to a crimson tint, or in the proportion of about a tablespoonful of the strong solution to a tumblerful of water, it forms an excellent lotion for washing ulcers and suppurating wounds, and, diluted to a pale pink color, makes a good gargle for an ulcerated throat. In the latter strength, it may be poured down drains, when it both purifies them and destroys the odor proceeding from them. A stronger solution (dark crimson or purple in color) may be used with advantage to wash or steep the hands after they have touched a foul wound or a person suffering from infectious disease. If the hands become brown after its use, this discoloration may be removed by oxalic acid. As a hair-dye, potassium permanganate gives a rich chestnut-brown color. As an antidote to poisoning by opium, strychnine, colchicum, oxalic acid, and toadstools (muscarine), potassium permanganate is most valu-

Pokeweed

able if administered at once; three or four grains may be given well diluted in water. A pale pink solution of potassium permanganate is also a delicate test for the purity of drinking-water; a drop or two allowed to fall into a glass of water should tinge the latter pink, but, if the pink color disappear, it indicates the presence of dangerous organic impurities.

Pokeweed.—This plant is now cultivated in the United States and Europe, especially in the woody sections. The juice of the berries has been used in rheumatism, and externally it is valuable to heal ulcers. Tumors decrease in size when rubbed with this ointment.

Picric Acid, or trinitrophenol, is produced by the action of nitric upon carbolic acid. It is used for preparing explosives, and so is employed in medicine only in solution. As it coagulates albumin without any further irritant action, it produces a soothing pellicle over any raw surface with which it is brought into contact. Its great use is for burns or bed-sores, strips of gauze saturated in the following solution:

℞ Picric Acid.....forty-five grains
Absolute Alcohol .....one and one-half ounces
Water to make.....one pint

being spread upon the burn, where they quickly dry and are retained in place. This dressing relieves pain, stops suppuration, and leaves a smooth scar.

Quinine is an alkaloid obtained from the bark of various species of cinchona trees. This bark is mainly derived from Peru and neighboring parts of South America. Other alkaloids and acid substances are also derived from cinchona bark, such as quinidine and cinchonine.

Quinine is generally used in the form of one of its salts, such as the sulphate of quinine, hydrochloride of quinine, or hydrobromate of quinine. All are sparingly soluble in water, much more so when taken along with an acid.

Quinine lessens the activity of lowly forms of life, and to bacteria it is very deadly. It is therefore, when dissolved in acidulated water, a powerful antiseptic, stronger even against some bacteria than carbolic acid. Its best known action is as an antiperiodic in checking the recurrence of attacks of malarial fever, and this action it exerts in all probability by virtue of its

destructive power against the malarial parasite in the blood. In fevers it acts as an antipyretic, having a powerful action in reducing temperature, and it also diminishes the tendency to abscess formation by rendering the movements of the white blood-corpuscles more sluggish.

In small doses it has a stimulating effect upon the stomach, though larger doses are capable of acting upon an irritable stomach to produce great nausea and vomiting. For persons affected in this manner, it is said that the hydrobromate is much less irritating than the more commonly used sulphate of quinine. Small doses have also a stimulating action upon the nervous system and a general tonic effect, while large doses cause decided depression of the respiration and of the heart's action. Among the other unpleasant effects due to large doses are ringing in the ears, temporary impairment of vision, and sometimes irritation of the kidneys.

Prickly Ash

The most marked use of quinine is its original one in malaria, attacks of which it quickly cuts short or prevents altogether. It is not useful, however, in the chronic malarial state. In fevers it is generally held that sulphate of quinine is among the safest antipyretic drugs, in doses of five or ten grains, but caution is necessary in giving even quinine when the heart's action is already feeble. Ammoniated tincture of quinine is a favorite household remedy in feverish colds and other mild febrile attacks, given in teaspoonful doses in water. The ringing in the ears which is apt to follow the use of quinine takes some time to pass off after it has been discontinued. Black-water fever has by some been attributed to the excessive use of quinine in severe cases of malaria. As a tonic, minute doses of quinine are much used. For example, a single grain of quinine is often given after meals, or it is more commonly combined with other tonics, as in the citrate of iron and

quinine, or in syrup of the phosphate of iron with quinine and strychnine.

Prickly Ash.—This tall shrub is found in the United States, mostly in wet meadows and moist ground. The bark acts very energetically on the urinary system, and has proved very valuable in chronic rheumatism. It is also used as a stimulant.

Refrigerants are substances which relieve thirst and give a feeling of coolness. The chief refrigerants are acidulous drinks such as lemon juice, weak mineral acids, tartaric acid, etc., in water. The parched condition of the mouth and throat that arises during hard work in a dry and dusty atmosphere is best relieved by water to which has been added some demulcent substance which forms a coating on the dried mucous membrane. Such liquids are obtained by mixing oatmeal or milk with water.

Rhubarb is the root of *Rheum officinale,* a plant originally derived from China and Thibet. It has a gentle purgative action when taken in large doses, and at the same time increases the flow of bile. In small doses it has merely a slightly stimulating action upon the functions of the stomach, and is very beneficial in atonic conditions of that organ. As a purgative the compound rhubarb powder is the form most commonly used, in doses of about forty grains or, roughly speaking, a teaspoonful. Small doses of the powdered root, one or two grains, are taken along with bismuth and soda to exert a soothing action on the surface, and stimulating action upon the functions of the stomach, and for the latter purpose the tincture or syrup of rhubarb is also used in doses of a teaspoonful.

Pleurisy-root. — This plant of the milkweed family is found throughout the United States, but grows

Pleurisy-root

more abundantly in the Southern States. It prefers open and gravelly soils, flourishing along gravelly streams and on hills. It has diaphoretic, expectorant, diuretic, or astringent properties. The root is a popular remedy for pleurisy, and is used in the form of a tea to promote perspiration; it is also recommended for colic, flatulence, and lung complaints.

Salicylate of Soda is a white crystalline substance which is prepared from salicylic acid. It is very soluble in water, and has a sweet, mawkish taste, which to most people is very unpleasant. This salt when dissolved in water has the power of increasing the solubility of various other substances. When taken internally in the course of acute fevers, and especially of acute rheumatism, it has the effect of reducing temperature, diminishing pain, and causing profuse sweating. Its action is therefore similar to that of antipyrine, phenacetine, and other coal-tar products. When taken for some time it causes fullness in the head, deafness, buzzing in the ears, curious disturbances of sight (so that the person may fancy he sees people in the room who are not there), and, if excessive doses be taken, great depression of the heart's action and of respiration. For the last-mentioned reason, great caution must be exercised when it is used by persons already exhausted by fever. The main use is in acute rheumatism, doses of ten, fifteen, or more grains being given several times daily, according to circumstances. In tonsilitis and other inflammations of rheumatic nature its use is also followed by great benefit. It is also given occasionally in gout.

X-Ray Treatment.—When an electric current of high potential is passed through a tube from which all the air has been withdrawn, the tube is filled with a phosphorescence produced by the impact on the glass at the anode of a beam of rays issuing from the cathode. These rays are electrons or "disembodied charges of negative electricity," and in addition to this perceptible phosphorescence, they produce, by their impact on the glass, new rays, known either as X-rays or Roentgen rays.

Though imperceptible to the eye, these X-rays travel with the same velocity as that of light, and can affect sensitive photographic plates in spite of dense objects intervening. They have a high power of penetrating solid substances, but this power is modified by the density of the object, and hence their value in photographing such a mixed structure as the human body.

Their ultimate nature is not yet certainly known. They are not composed of material particles, nor are they deflected by magnets. They may be described as "pulsatile vibrations in the ether," with a very short wave-length, and the shorter the wave-length the more penetrating the ray.

Applied to the surface of the body they have a stimulating effect, but on prolonged application they may be both irritating and destructive.

Their use in medicine has been twofold: in diagnosis, where they are employed to photograph or shadow forth, on fluorescent screens, internal organs and structures, especially bones, and in treatment, where their penetrating and stimulating properties are utilized to combat the progress of disease.

The apparatus for X-ray work varies greatly, but essentially it is the same everywhere. It consists of a glass tube about a foot long, the middle half of the tube being dilated into a bulb.

This tube is made either of soda glass, which permits the X-rays to escape freely, or of lead glass provided with a window of soda or other non-absorbent glass. In the central bulb are two anodes, which may or may not be connected with each other outside the tube. One of these anodes is made of aluminum, and is placed toward the side of the tube. The other anode, which is made of copper coated with platinum or some other substance having an equally high or higher melting-point, is situated opposite the cathode, and is known as the anticathode. It is at such a distance from the cathode that the beam of rays producing the X-rays is almost, but not quite, focused on it. It is tilted at an angle of 45° to the axis of the cathode. Its coating of platinum or other metal is needful to resist the intense cathodal rays, and in some tubes there are air-cooling and water-cooling mechanisms to increase its resisting power. The cathode is made of aluminum, and is concave-faced, in order that its rays may be properly focused. There is an almost complete vacuum in the tube, the pressure being reduced to one millionth of an atmosphere. Most tubes are provided with a device for lowering the vacuum—an "osmonegulator." A tube with a high vacuum is called "hard," and that with an insufficient vacuum is called "soft"—the normal tendency being for the tube to become "hard," though under other circumstances the tube may become "soft." The higher the vacuum, the more

intense is the impact of the cathodal rays on the anticathode, and the stronger and more penetrating will the X-rays be, though from such a "hard" tube the quantity of X-rays is less. From a "soft" tube more numerous but less penetrating X-rays are given off. Hence in medicine the "hard" tube is employed for photographing denser and deeper parts. And as rays which pass completely through tissues have little effect on them, and only the rays which the tissues stop and absorb affect them, for treatment of those superficial conditions in which X-rays are mainly employed, a "soft" tube is used.

The current through the tube is of 50,000 to 150,000 volts, and is obtained from different sources, from a static machine, from a street current, or from an induction coil, which last apparatus is the most satisfactory. The higher the voltage of the current, the more intense are the cathodal rays and the more penetrating are the X-rays. And in order to regulate the penetrating power of an X-ray tube, various indicators and adjusting mechanisms are employed both for the vacuum in the tube and the current passing through it.

Radium is a highly radioactive metallic element obtained from pitchblende, and acts with remarkable energy. It burns paper when in contact with it, decomposes water, and oxidizes rapidly in the air. The energy of radium is reckoned to last about a thousand years, and it gradually deteriorates into less active metals as it gives off particles and radiations.

Radium emanation is a gas which is given off slowly from solutions of radium salts. If a little bromide or chloride of radium be placed in a closed flask, this in the course of some days becomes filled with a radioactive gas which can be drawn off by an air-pump and filled into glass tubes or dissolved in water. This gas or emanation possesses the power of giving off rays like radium itself, but it very quickly wastes, and in four days has only half its original strength. As the radium requires about the same time to produce a fresh quantity of emanation, and as the supply is practically inexhaustible, a few milligrams of radium can be used to produce a constant supply of emanation, which is removed by the air-pump every few days.

Treatment by Radium.—The beneficial action of various mineral waters has been attributed to minute quantities of radium which they contain. While the presence of radium ema-

nation, which retains its powers only for a few days, may explain the great superiority in action of these waters drunk fresh at their source over the same waters bottled and preserved for some time, yet this theory has undoubtedly been pushed to a fanciful extreme. Radium emanation is now used in some hospitals, dissolved in water for internal administration and also for inhalation. It is also employed in glass tubes of various shapes for application to tumors, etc., just like the solid salt; but these tubes of emanation must be refilled every few days.

Radium salts are applied inclosed in various forms of applicator, most commonly in a thin glass tube inclosed within a capsule of aluminum.

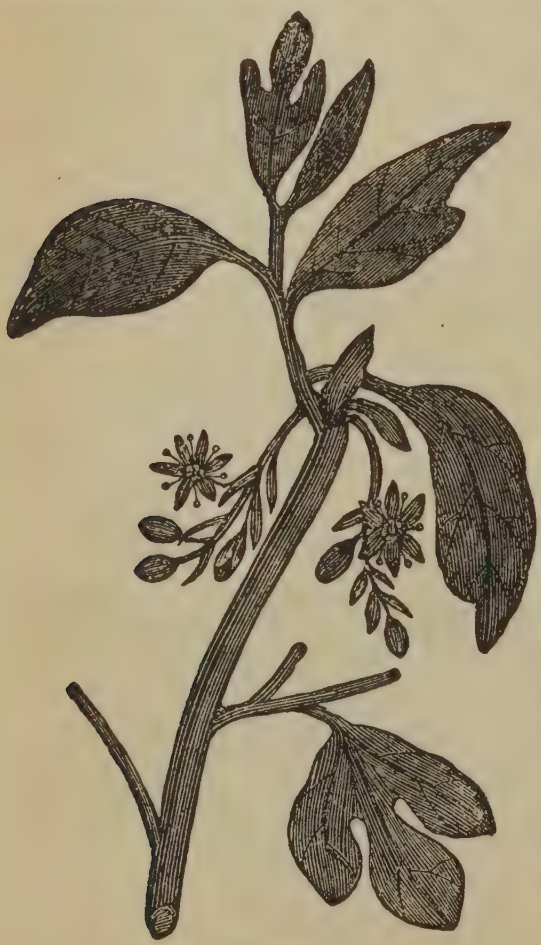
Generally speaking, its use is limited to the treatment of superficial conditions like rodent ulcer, lupus, nevus, in which it sometimes effects brilliant cures. It is also used for the destruction of tumors which by reason of their size or position cannot be removed by surgical means; capsules of radium are then buried in openings at various points of the tumor. The tumor cells, thus exposed to a cross-fire of the rays, degenerate, and the tumor decreases in size, the capsules of radium being removed after acting for some hours or days. These capsules are also very suitable for application to internal cavities like the gullet, where the X-rays could not come into play. It must be remarked, however, that neither the X-ray nor radium supersedes active surgical measures when these are available for the removal of a tumor.

Rose

Rose.—This shrub is a native of the south of Europe, but is very extensively cultivated in the United States. Its flowers are used as an astringent and tonic, valuable in hemorrhage and mucous discharges. In the form of a water it is recommended in eye affections. It is also used as an infusion and a syrup.

Salicine is an active principle derived from the bark of several species of poplar and willow trees. It is a crystalline powder of bitter taste and slight solubility. It is much used for the treatment of acute rheumatism, just as salicylate of soda is used.

Salicylic Acid is a white substance in fine crystals, of sweetish taste, and sparingly soluble in water. It is derived from salicine, and is contained also in oil of wintergreen, oil of the sweet birch, and in various other plants. It is also produced in large quantities by the action of carbonic acid gas upon carbolic acid. When produced in the latter manner it is much cheaper than when extracted from plants, though the natural salicylic acid is purer and better.



Sassafras

Salicylic acid prevents putrefactive processes, and is therefore used to preserve food substances, and also to saturate surgical wool, lint, and other dressings. It has no odor, like carbolic acid, but being non-volatile it is not so efficient as the latter. Externally it is used in ointments to check various skin affections due to bacteria, and since it has in addition a softening action on the surface of the skin, salicylic

acid plasters are used to remove corns and various other superficial overgrowths.

Internally salicylic acid causes great irritation of the stomach, and is therefore seldom used, its place being taken for internal administration by salicylate of soda.

Salines are purgatives belonging to the class of salts which produce watery evacuations.

Sassafras.—This tree is a native of North America and is found growing plentifully throughout the United States in forests and along the borders of swamps. It possesses properties that are stimulating and alterative, and very good in rheumatic complaints and eruptive diseases. The bark and twigs give off a mucilage which is valuable in catarrhs and severe attacks of dysentery. It is given with other drugs as an alterative. The mucilage put in rose-water is good for inflammation of the eyes.

Sal Ammoniac is another name for chloride of ammonium, which is largely used in cough mixtures and lozenges as an expectorant. A small piece placed between the teeth and cheek and sucked takes a long time to dissolve, and greatly softens the cough produced by irritation of the throat or bronchial tubes.

Sandalwood-oil is a yellowish, fragrant-smelling oil with bitter taste obtained from the wood of the sandalwood tree by distillation. It has an antiseptic action and is administered in doses of from five to twenty drops, frequently, for inflammation of mucous membranes, particularly those of the urinary organs.

Silver is used in medicine externally, and to a less extent internally, in the form of its salt, nitrate of silver. If this substance be taken in great quantity internally, it acts as an irritant poison; but if silver come in contact with the body only in small amount, and over a long period, it produces no evident effect beyond a grayish-brown discoloration of the skin and of internal organs, in some of which the silver is deposited as minute granules.

Raspberry.—This plant is found plentifully in the eastern part of the United States. Its fruit is recommended as an expectorant and refrigerant. A tea is made from the dried raspberries, which is excellent for children suffering from a cold or with

Raspberry

cough on the chest. The infusion when given hot is also used to induce perspiration.

Saccharine, or glusidum, is a coal-tar product of white crystalline appearance. It has an extremely sweet taste, being prepared in various strengths so as to equal in sweetness from 300 to 500 times its own weight of cane-sugar. It escapes from the body unchanged, having practically no effect upon the tissues beyond its influence upon the sensation of taste. Accordingly it is used by diabetics, corpulent persons, and others to whom sugar is for some reason harmful.

Salol is a white, crystalline, tasteless substance with faint, aromatic odor. It is a compound of salicylic and carbolic acids, and since it remains unaffected in the stomach, but is broken up into its components by the pancreatic juice on entering the small intestine, it is widely used as an intestinal antiseptic, when it is desired to check fermentative and putrefactive changes. It is also used as an antiseptic for inflammation of the bladder, because its products, being excreted in the urine, exert an antiseptic action in the bladder.

Salvarsan, also known as dioxydiamido-arsenobenzene, is an organic compound of arsenic introduced by Ehrlich for treatment of syphilis and other chronic infectious diseases. Recently a modification, *Neosalvarsan,* prepared by the action of formaldehyde sulphoxylate on salvarsan, has been found more suitable. It has a special affinity for and destructive action on lowly forms of animal life, like the parasites of sleeping sickness, syphilis, etc. Dissolved in sterile, distilled water or in emulsion, it is injected direct into a vein or into the substance of a muscle. Its

action in syphilis is controlled by doing the Wassermann test for this disease before and again some time after its use.

Saffron.—This plant is cultivated in the United States and is known as garden saffron. It is employed in the form of a tea to induce perspiration, and for this reason it is very valuable in eruptive diseases, measles, smallpox, and high fevers.

Saffron

Santonine is a yellow crystalline powder obtained from santonica, also known as wormseed, the dried flowers of *Artimisia maritima,* which is brought from the Levant. It is used for its action in expelling worms, as it is highly poisonous to roundworms and threadworms, though it has little or no action upon tapeworms. Santonine is generally given in doses of about ½ grain to children or one grain to adults, with caution repeated several times on one day, and it is very commonly taken in the form of lozenges containing ½ grain each. Like other remedies against worms, its use must be preceded by a period of fasting and followed by a dose of castor-oil or Epsom salts. When too large a dose has been taken, yellow or green vision is apt to result for a time, and it is said that when incautiously large doses have been taken, a permanent impairment of sight has resulted.

Sedatives are drugs and other measures which soothe overexcitement of the nervous system, whether the effect of this excitement be pain, sleeplessness, delirium, or muscular spasm.

Those sedatives that soothe pain are generally spoken of as anodynes; sedatives in sleeplessness or delirium are known as hypnotics; sedatives of spasm are called antispasmodics.

Sarsaparilla

Sarsaparilla.—This is a native plant of South America, but of late it has been naturalized in this country. It is used extensively as an alterative, and is especially valuable in the form of a syrup. With other organic salts, it is recommended as a blood purifier.

Seidlitz Powder, or compound effervescent powder, is a mild purgative composed of Rochelle salt and bicarbonate of soda, which are wrapped together in a blue paper, and tartaric acid, which is wrapped in a white paper. The contents of each paper are dissolved separately in a little water—half a glassful or less; the two solutions are then mixed and quickly swallowed while effervescing. For most persons one powder is not sufficient, but two taken in the morning form a mild and efficient remedy in constipation associated with headache and sickness.

Sodium is a metal whose salts are white, crystalline, and very soluble. The fluids of the body contain naturally a considerable quantity of sodium chloride, or common salt, and therefore the salts of sodium, when used as drugs, have little effect depending upon their metallic base. They act similarly to the corresponding salts of potassium.

Sodium Carbonate, commonly known as soda or washing-soda, has a powerful softening action upon the tissues. It is not often

used internally, since in large doses it is a corrosive poison, but a solution in warm water is often used as a cleansing agent for the skin, as a lotion to syringe the ear in order to soften and remove hardened wax, and in fomentations for application to rheumatic joints.

Sodium Bicarbonate, or baking-soda, is largely used as an antacid in acidity of the stomach, gout, rheumatism, and other diseases. It is taken in doses of ten or twenty grains, as a rule, or as much as will stand upon a dime. The citrate, or acetate of sodium, is used in a similar manner, though the corresponding potassium salts are more frequently employed than these.

Senega.—This plant grows wild in the central part of the United States. It is a stimulant and expectorant. In fevers it is good as a stimulant. Made up as a decoction, it is valuable for chronic coughs. It is also recommended for hives.

Senega

Stimulants are drugs and other agents employed to call forth special powers of the body or of individual organs in order to effect some special purpose or to offer resistance to some acute attack of disease. In its broadest sense, the term stimulant included all remedies which are not simply foods destined to supply the wear and tear of the body and to provide it with a store of energy-producing material. It also excludes remedies which have a sedative action upon the nervous system or other organs, and remedies which act directly upon the causes of disease without any reference to the body, such as antiseptics. Many substances, such as aromatics, spices, and bitters, stimulate

the function of the stomach. Various substances stimulate a flagging heart, such as ammonia, alcohol, ether, volatile oils, and strychnine, and are used when this organ shows signs of sudden failure; while these and other substances act upon the nervous system so as to produce for a time a general sense of well-being, and are therefore known as general stimulants, such as alcohol, ether, Indian hemp, opium, cocaine, tea and coffee.

Slippery Elm

Slippery Elm.—This is a native tree of North America. The bark is useful in all urinary and bowel complaints, sore throat, and pleurisy. It is very good, in the form of a poultice, for ulcers of the skin. Taken in the form of a tea, it has been found good for labor pains.

Suppository is a small conical mass made of fat or glycerine-jelly, and containing drugs intended for introduction into the rectum. This method of using drugs may be chosen for various reasons. For example, the suppository, as in the case of soap or glycerine suppositories, is often used to produce an aperient action. Other suppositories, such as those of belladonna or morphine, are used to quiet pain and check the action of the bowels. Others are used for the sake of their influence on neighboring organs. In still other cases, substances are administered in suppositories by the bowel because an irritable stomach will not retain them, as, for example, in the use of peptonized meat suppositories.

The suppository is placed with its pointed end against the anus and with a firm but gentle screwing movement is pushed upward. With the point of the forefinger it must be pushed onward for about an inch, past the sphincter muscle, otherwise it will not be retained. It must be quickly introduced, as the material of which it is composed rapidly softens when brought into contact with the body.

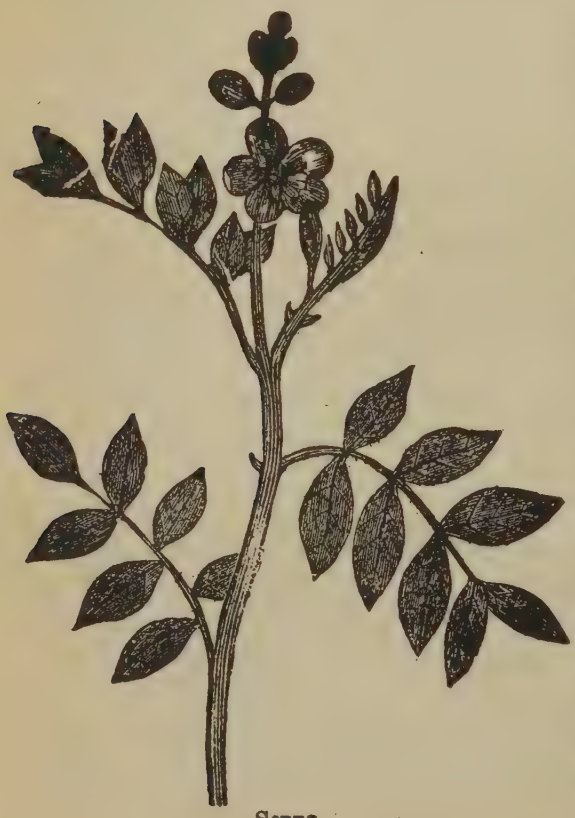
Striped Alder.—This plant is found plentifully all over the United States, and especially in marshy lands of the South. It is recommended as an astringent, an antiseptic, and a refrigerant. In cases of severe vomiting it is advisable to give some of the infusion. Externally, the leaves are used to allay the pain of inflammations. The infusion is made by adding two teaspoonfuls of the drug to a pint of water.

Striped Alder

Specific is a term used in various ways. It is applied to remedies which appear to have a definitely curative effect in certain diseases, as, for example, to salicylate of soda, which is said to be specific in rheumatism, or to quinine, which is a specific for ague. Again, it is applied to bacteria and other agents which form the chief cause of certain diseases, though there may be other minor contributing causes; for example, the comma bacillus is the specific cause of cholera, the acarus parasite is the specific cause of the itch. The term is also used to designate diseases that have an identity of their own, are due to a definite cause, and do not consist merely of a group of symptoms; for example, scarlet fever, measles, typhoid fever, are specific as compared with vague ailments such as enlargement of the glands in the neck, diarrhea, or dyspepsia. The word "specific" is also used as a term for venereal disease.

Sulphates are salts of sulphuric acid, and their action and uses vary much according to the metal with which the acid is combined. The sulphates of the heavy metals, which are soluble in water, viz., the sulphates of iron (green vitriol), zinc (white vitriol), and copper (blue vitriol), have a powerful astringent action; while sulphates of the alkalies, viz., the sulphates of sodium, potassium, and magnesium (Epsom salts), are used as saline purgatives.

Sulphonal is an artificially prepared substance which is white, odorless, tasteless, and dissolves readily in warm water or in alcohol. It has a depressing effect upon the higher nervous centers in the brain and therefore acts as a hypnotic, though it has practically no effect upon the vital centers or spinal cord, and therefore is not a dangerous remedy like many other hypnotics. The usual dose is about twenty grains.



Senna

Senna.—Most of the senna used comes from East India. It is found in all the countries around the Mediterranean, and the best grade comes from Alexandria. It grows as a small shrub with yellow flowers and small green pointed leaves. It is commonly used in the form of a tea, with a little manna added to it. It is a very useful cathartic, operating effectually and mildly. It is necessary to combine it with other ingredients, to prevent its griping effects. It is a good remedy to give with worm medicines for children, especially with pinkroot. Senna and salts mixed make a good laxative.

Sulphur is a non-metallic element which is procurable in several forms, and enjoys a wide use both in prescriptions and in domestic medicines. The crude sulphur is obtained in volcanic districts, and from it sublimed sulphur is prepared by heating. This sublimed sulphur is either run into molds as rolled sulphur, or allowed to deposit as flowers of sulphur, which consists of a fine gritty powder and is the most commonly used form. The flowers of sulphur may be washed to free it from irritating impurities, after which it is known as washed sulphur. Again the sublimed sulphur may be boiled with slaked lime and treated with hydrochloric acid, when the sulphur settles down in the form of a fine grayish-yellow powder. This sediment consists of precipitated sulphur, which is quite free from grittiness, and which is also known as milk of sulphur.

The action of sulphur depends partly upon the grittiness of the flowers of sulphur, and mainly upon the readiness with which sulphur enters into chemical combinations to form sulphides and sulphates. In consequence of this property, it is possessed of disinfectant and antiparasitic powers. When taken internally, the sulphides that are formed stimulate the action of the bowels, and, being excreted partly from the surface of the skin and mucous membranes of the air-passages, they also stimulate these. Sulphur is burned in order to produce sulphurous acid gas, which is widely used as a disinfectant. Externally, sulphur ointment is one of the best remedies against the minute parasite that is responsible for the itch; and milk of sulphur is used in lotions for acne on the face. Sulphur is also used in baths for its stimulating action on the skin in cases of skin disease, rheumatism, etc. For this purpose either plain sulphur, or more commonly sulphuret of potash, is added in the amount of a quarter or half a pound to thirty gallons of hot water. Internally, sulphur is a time-honored remedy for constipation, in doses of a teaspoonful or thereabout made into a paste with molasses. It may be used for the same purpose in the more palatable form of lozenges, several of these being taken at one time, and has a gentle laxative action. In old persons who suffer from rheumatism and who are liable to constipation and to bronchitis, sulphur is a specially useful remedy. A similarly beneficial action is obtained from the use

of vegetables containing large quantities of sulphur, such as lentil soup or boiled onions.

Spearmint

Spearmint.—This aromatic herb is found along the rivers of the United States. It acts as a stimulant to the urinary organs, and is an excellent remedy for stomach disorders and for stones in the urine. The oil is valuable for rheumatic affections.

Sweet Spirit of Niter, also known as spirit of nitrous ether, consists of a mixture of water, alcohol, aldehyde, and various nitrous bodies. It is prepared by a complicated process of distillation from nitric acid and rectified spirit. Probably no remedy, with the exception of castor-oil, enjoys such wide-spread use in household medicine as sweet spirit of niter. It is possessed of very active properties, and, unlike most powerful drugs, it is practically harmless even in the hands of the unskilled, except in so far as dependence upon it may be a source of danger to cases which require more active medical interference. Like other drugs containing nitrites, sweet spirit of niter has a powerful action in checking spasm of all sorts and in dilating the blood-vessels. In certain conditions it is a diaphoretic, causing copious perspiration and thus reducing feverishness. In other conditions it acts as a diuretic, markedly increasing the action of the kidneys. When kept in unstoppered bottles, however, it

rapidly loses its strength, and therefore, to be of any value, must be used fresh.

In spasmodic affections of all sorts, such as colic, cramp, asthma, it is of value. In cases of chill and fatigue followed by feverishness, loss of sleep, and the passage of urine in small quantities loaded with urates, it acts as a sedative and increases the flow of urine. In those attacks of feverishness, restlessness, sleeplessness, and sometimes mild delirium, which in nervous children are apt to follow upon any unusual excitement, exercise, or fright, it has a similarly beneficial effect. For this purpose it should be given in a quantity of cold water.

In the first stage of a cold it may be used in conjunction with warm drinks such as hot lemonade, and with hot foot-baths immediately before getting into bed. In such a case it sets up a copious perspiration and assists in cutting short the cold.

The dose of sweet spirit of niter is about a teaspoonful for adults and five or ten drops for very young children.

Spikenard.—This plant is found in the northern part of the United States. It stands about five feet high, with blue flowers, producing berries with a sweet, aromatic taste. It blossoms in July and the berries ripen in September. The root of this plant is a stimulant, an expectorant, and a diaphoretic. The roots and berries are boiled up with water, and sugar added; this makes an excellent cough remedy. If necessary, brandy may be added to improve the above.

Spikenard

Tannin, or tannic acid, is an uncrystallizable white or yellowish-white powder, which is very soluble in water or glycerine. It is extracted from oak-galls in large amount, but it is also present in almost all vegetable infusions. Tannic acid, when brought in contact with any mucous membrane, constringes it and diminishes its secretion. It coagulates albuminous substances and thus hardens animal food with which it is mixed, and also leads to rapid clotting of blood with which it is brought in contact. When absorbed into the circulation it is changed into gallic acid, a substance of similar but weaker properties.

Tannin is used largely as a styptic to apply directly to bleeding wounds or surfaces with which it can be brought in contact, as the mouth, interior of the stomach or of the rectum, and since its action in coagulating albumin is powerful, it speedily causes a clot to form. Owing to its astringent effect, it is a useful application to relaxed mucous membranes; it is employed, for instance, in lozenges when the throat is relaxed, or applied in ointment for piles. Glycerine of tannin is also a convenient method of applying this substance as an astringent, by painting, to the throat. It is also used to check diarrhea, administered either in the form of some vegetable astringent infusion, or in a chemical combination which is not destroyed in the stomach, such as tannalbin, tannigen, or tanocol.

Solomon's-seal

As tannin neutralizes many poisonous alkaloids, it is often administered as an antidote to vegetable poisons.

In addition to lozenges, suppositories, ointments, and glycerine of tannic acid, many vegetable astringents owe their usefulness to the tannin they contain, as, for example, catechu, kino, and rhatany.

Solomon's-seal.—This herb is found all over the United States, along meadows and mountainsides. The stalk stands about seven inches high; the flowers are in umbels, with dark

green leaves which hang on the sides of the stalks, producing red berries.

The properties of the plant are astringent, and the mucilage of the root is good when applied to inflammation and piles. It is also a valuable remedy for leucorrhea and decreased menstrual flow.

Wild Camomile is found all over the United States in open fields. It has a characteristic odor, and blossoms from June to November. It has all the properties of camomile, but is weaker and less pleasant to the taste, and is valuable as a stimulant and emetic. The external use in fomentations is proper for white swellings, rheumatism, and sprains. It induces perspiration and increases the action of emetics. Country people esteem it highly for promoting perspiration in many incipient complaints. It is made up as an infusion, and a glassful may be given three or four times a day; to promote perspiration, it should be taken warm.

Eucalyptus, or blue-gum, is a tree, originally a native of Australia, but now grown all over the world. Its important constituent, oil of eucalyptus, is an oil of pleasant smell and spicy taste, which is obtained by distillation from the leaves of the tree. From the oil there is also obtained a camphor-like body known as eucalyptol. Similar oils are obtained in varying amount from most species of gum-trees.

The oil of eucalyptus is largely used as a disinfectant and deodorant. Two ounces placed in a porous earthenware vessel, so as to impregnate its substance, will keep the air of a water-closet, in which the vessel is suspended, perfectly free from odor for several months. For a similar purpose, it may be mixed with eight times its weight of sawdust and used to sprinkle on floors.

As an inhalation, oil of eucalyptus may be mixed with smelling-salts, or a teaspoonful may be stirred into hot water in a steam-kettle. This is useful both for checking a cold or an attack of influenza and for relieving headache.

For malaria, the oil is sometimes given, though its use is doubtful, in place of quinine, in five-drop doses on sugar.

Both the oil and eucalyptol are used, dissolved in olive-oil or petrol, for an antiseptic lubricant to catheters, and for an application to the nose and throat. The oil is also added to carron-oil in order to make this application antiseptic.

Skullcap

Skullcap.—This plant is found all over the United States in meadows and woods, blossoming in the summer. It is used as a tonic, and is remarkably efficacious in chorea, St. Vitus's dance, convulsions, tetanus, and tremors. When given freely in the form of an infusion it is an excellent nerve tonic.

Tar is a thick, dark, oily substance obtained by the destructive distillation of several species of pine-tree. It is slightly soluble in water, more readily so in alcohol, oils, and strong alkaline solutions. Other tars of similar physical and medicinal properties are obtained from other woods, as well as from coal, shale, and peat; for example, birch tar, well known for the aroma it imparts to Russian leather. Generally speaking, wood-tar contains resin, creosote, and turpentine in considerable quantities, also benzol, carbolic acid, acetic acid, wood-spirit or methyl alcohol, methyl-acetate, acetone, and wood-naphtha. The aniline dyes, antipyrine bodies, saccharine, and various other medicinal substances and disinfectants are obtained indirectly from coal-tar.

In consequence of the numerous medicinally active bodies it contains, tar exerts many marked effects upon the body. By reason of the creosote, carbolic acid, and methyl alcohol that it contains, it possesses a high antiseptic and preservative power. Certain of its ingredients are of an irritating nature, and tar therefore stimulates powerfully the action of any skin surface with which it is brought in contact, as well as the respiratory and other mucous membranes by which it is excreted after being taken internally.

Externally, tar is one of the most efficient preservatives of animal and vegetable tissues that we possess. For its germicidal action and stimulating properties it is largely used in

chronic skin diseases, particularly psoriasis and dry eczema. To this end it is employed most commonly in the form of tar ointment, rubbed in night and morning, or smeared upon a cotton cloth and worn round the affected part. An alcoholic extract known as "liquor carbonis detergens" is also used to cleanse areas of skin affected by the disease.

Internally, its chief use is in chronic bronchitis as an expectorant. It both checks excessive expectoration and renders coughing easier, while in those who suffer habitually from winter-cough it is said to diminish the liability to catch cold. For this purpose it is most commonly used in the form of *tar-water,* made by shaking up one part of tar with ten of water, allowing to settle, and decanting the clear liquid. This tar-water may be taken in wineglassful doses. Syrup of tar is simply tar-water sweetened with sugar.

Tansy.—This well known aromatic herb is a native of Europe, growing in moist pastures and on borders of corn-fields. It is a valuable tonic and stimulant for obstructed menses. In the form of a tea it is found valuable for fevers. In dropsy it relieves the congestion.

Tansy

Tartar is a concretion that forms on the teeth near the margin of the gum, consisting chiefly of phosphate of lime deposited from the saliva. Mixed with this are food particles, and in it flourish numberless bacteria. It is important that it should be prevented from forming by regular brushing of the teeth, or removed after it has formed, because it gives rise to wasting of the gums and loosening of the teeth, as well as to dyspepsia, bad breath, and ill health.

Tartar Emetic, tartrated antimony, or tartrate of potassium and antimony, is a white crystalline substance, which in minute doses acts as a diaphoretic and expectorant, in larger doses (one

to two grains) as an emetic, and in very large quantities or in small quantities administered over a long period as an irritant poison. It must not be confounded with cream of tartar, which is another name for bitartrate of potassium, a harmless substance.

When this substance has been taken in poisonous amount, it produces a strong metallic taste and soreness of the mouth and throat, followed speedily by vomiting, pain in the abdomen, and purging, and at a later stage by great depression and collapse. The treatment of acute poisoning consists of encouraging the vomiting by copious drinks of warm water, milk, flour in water, or other mucilaginous substances which have the further benefit of soothing the irritated mucous membranes. Tannin acts as a direct antidote to this poison by forming a harmless tannate of antimony, and therefore a strong infusion of tea, coffee, oak-bark, or other substance containing much tannin, should next be prepared and administered.

Virginia Snakeroot

Tartaric Acid is almost identical with citric acid in appearance, chemical properties, and medicinal uses. Tartaric acid is obtained from grapes, while citric acid is contained in many fruits like the lemon, lime, and orange.

Virginia Snakeroot.—This is distributed all over the United States. It has a penetrating, aromatic smell similar to valerian. It has been found valuable in inducing perspiration, and is also used as a tonic. It is valuable also for dyspepsia, as it strengthens the stomach. The drug is given in the form of a tea, and if given to induce sweat it should be warm.

Tonics are remedies which gradually restore the muscles, nerve-cells, and various bodily organs from a lax and sluggish state to a condition in which they are

ready for immediate activity. The term, like the name stimulants, is very vague, but while stimulants cause immediate increase of activity, tonics act more slowly and give a sense of increased well-being and strength.

There are many types of tonics acting in different ways, though all require time in order to exert their beneficial action.

Nervine tonics act through the nervous system, and, by increasing its activity, render the muscles firmer and the secretions of the internal organs more healthy. Among these may be mentioned nux vomica and strychnine, cinchona and quinine, also cold-bathing, and increase of daily exercise in the fresh air.

Gastric tonics increase nutrition when the stomach and other digestive organs are so weak that they are unable to utilize the food presented to them. As examples of these, we have malt extract, cod-liver oil, petroleum emulsion; bitters such as calumba, quassia, gentian, bitter beer; and dilute acids, such as hydrochloric acid, nitric acid, citric acid.

Another group, often known as *blood-tonics,* supply some substance which is necessary for the bodily activity and which is either wanting from or insufficiently supplied by the person's ordinary diet. Among these may be mentioned fats, common salt, iron, lime salts, and various special forms of diet.

Still other tonics act by *altering the chemical changes* that take place in the tissues, among which may be mentioned arsenic and phosphorus, and perhaps the salts of zinc, silver, and gold which are sometimes administered. Change of air, as for example from a town to the seaside, produces its beneficial effect in all probability to a great extent in this fashion.

In another class, tonics act by *removing waste products* and other poisonous materials from the body, and these include massage, baths, exercise, iodides, and the various drugs which stimulate the skin, kidneys, and bowels to increased activity.

Most tonics have, however, a *combined effect,* exerting two or more of the actions just mentioned.

In cases where the nervous system is jaded by constant work, as shown by dullness, loss of memory, languor, and liability to speedy fatigue, some of those tonics mentioned above as nervine tonics are of most benefit. Persons whose atonic condition manifests itself by dyspepsia are aided by some of the gastric tonics. Some of the nutritional defects will not be remedied

till the special substance that is wanting has been supplied, as for example some preparation of iron in bloodlessness.

Among the generally useful tonics are the following. In children and young persons of feeble physique or after some acute illness, the compound syrup of the phosphate of iron is very suitable. In adults whose nervous system is overworked and digestion out of order, the compound syrup of the hypophosphites acts extremely well. Where a more powerful tonic, acting more speedily, is desired, the syrup of the phosphate of iron with quinine and strychnine is also useful. Any of these tonics should be taken in a large quantity of cold water immediately after a meal.

Although tonics form a valuable class of remedies, their employment may be a source of danger through conferring an artificial sense of well-being upon a person who stands in need of more energetic treatment or of complete rest, as for example a person suffering from neurasthenia or early consumption. In such a case, the mere use of tonics, although it enables the person to go about his usual pursuits for some time longer, leads in the end to a more complete breakdown. For this reason, and owing to the fact that the particular tonic which will suit the combination of symptoms in any given case is a matter for careful consideration, it will be seen that the opinion of a medical adviser is desirable even in so apparently simple a matter.

Witch-hazel

Witch-hazel. — Found along the mountainous area of the New England States. This tree blossoms in the winter. The bark may be applied externally as a poultice in ulcers. The decoction is

good for an injection into the vagina, or for falling of the womb. It is also used locally in bruises, sprains, and external piles.

Urotropine is a substance made by the action of ammonia on formalin. It is excreted by the kidneys, and, setting free formalin gradually in the urine, has a powerful antiseptic action. It is given in cases of cystitis when the urine decomposes within the bladder, and it exerts its beneficial action very speedily. The dose is five or ten grains several times daily.

Valerian is the root of a European plant. Its action, which is a sedative one upon the nervous system, depends mainly upon a volatile oil that it contains, and perhaps also to some extent upon valerianic acid. Valerian is used chiefly in the form of the tincture of valerian, to quiet nervousness, insomnia, and hysterical attacks, being taken in doses of a teaspoonful or thereabout. The oil of valerian is useful, in doses of two or three drops on sugar, for the relief of dyspepsia associated with spasm of the stomach.

Vaseline is the name given to a soft paraffine which is extensively used as a protective coating to superficial wounds, as a lubricant for instruments, and as a basis for ointments. It possesses the valuable property of being unchanged by the action of bacteria, so that it neither allows of the growth of organisms that happen to fall upon it, nor does it become rancid.

Veratrine is an alkaloid, derived from cevadilla seeds, which has a paralyzing effect upon nerves. The ointment of veratrine is accordingly used for the relief of pain in cases of rheumatism or of neuralgia.

Veratrum, also known as green hellebore, Indian poke, and pokeroot, is the root of a plant of the United States. It acts as a sedative and depressant of the heart and nervous system by virtue of the alkaloids, jervine, veratrine, and veratroidine, that it contains. The drug is but seldom used, being given sometimes in the form of tincture, chiefly for the quieting of convulsive conditions.

Verdigris is a basic acetate of copper. It may be formed by the action of fruit juice on copper saucepans or dishes which are not kept clean, and is said to have given rise to poisoning which is very dangerous.

Virginia Speedwell

Virginia Speedwell.—This plant is especially abundant in the southern part of the United States. The main action of the drug contained in its stems is on the urinary organs. It is especially recommended in dropsy, and is also said to be of value for congestion of the liver. The drug is made up as an infusion and given in tablespoonful doses every two hours.

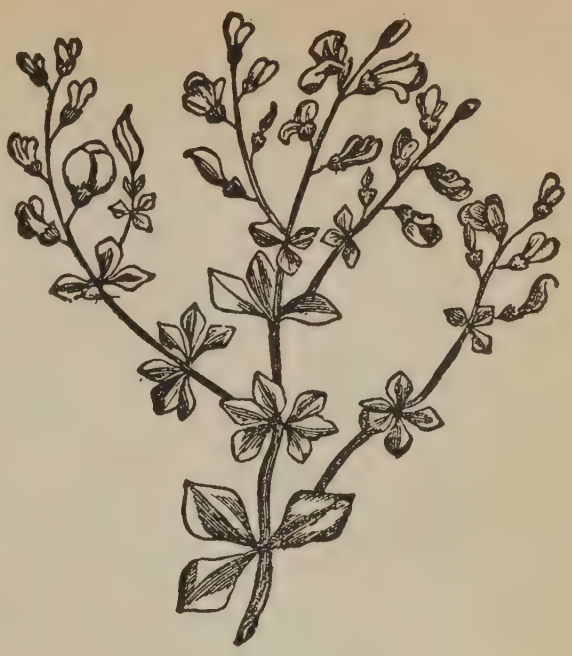
Sage.—This is a common plant of the gardens in the southern part of the United States. It has been used as a gargle, and is a popular remedy for coughs and colds. It is best administered in the form of tea, and if intended for fever it should be given warm.

White Oak.—Found growing abundantly throughout the forests in the United States. The bark has been recommended as an external astringent and antiseptic. A strong decoction is useful as a gargle and for gangrenous ulcers. By inhaling the powder people with pulmonary troubles have been benefited. It forms an excellent wash or injection.

Warburg's Tincture is a complex liquid containing no less than fourteen ingredients, of which the chief is quinine. It used to enjoy a great reputation in the treatment of malaria, etc., given in doses of one tablespoonful.

Wild Indigo is found all over the woods of the United States. In the fall the entire plant becomes black.

The drug contained in the flowers is used as an antiseptic, a purgative, an emetic, and a stimulant. This plant in the form of a poultice is very efficacious in inflammations bordering on gangrene. It has been found successful with all ulcers, and may be used as a wash or made up as an ointment.



Wild Indigo

Wet-pack is a method of treatment much in vogue in some countries and by some physicians for the purpose of applying cold when it is desired to exert a gentle cooling influence over a prolonged period, one hour or more, and at the same time to maintain the patient in a condition of absolute quiet and rest. It is used, for example, in such conditions as neurasthenia, and exhaustion due to heat. When a more rapid degree of cooling is desired, the patient is changed from one wet-pack to another every quarter of an hour or thereabout, two beds being placed near each other for this purpose. Very rapid cooling may be achieved by wrapping the patient in a wet-pack and rubbing down the sheet in which he is enveloped with pieces of ice.

Cold-pack.—A rubber sheet covered by a large blanket is spread upon the bed, and when the patient is ready, a sheet is dipped in cold water, wrung out fairly dry, and laid over the blanket. The patient, stripped, is laid upon the sheet, which is quickly turned over him from both sides, and pushed between his legs and between each arm and the chest, so that skin does not touch skin anywhere. This must be done quickly, and the sheet being neatly tucked in round the neck and folded beneath the feet, every part of the body is covered except the head and face. The head may also be wrapped in a wet towel. Finally the sides of the blanket are turned over the patient, and wrapped round him so as to lie smoothly everywhere. The patient, enveloped in this pack, lies absolutely helpless and should on no account be left by the attendant till the pack is removed, when he is put back into bed.

Hot-pack.—Use a rubber sheet, a dry blanket, and a second

blanket which has been thoroughly wrung out of boiling water poured over it. This is quickly applied like the cold-pack; the patient may lie enveloped in it for twenty minutes, and is then quickly dried with warm towels and put back into bed.

Water Hoarhound

Water Hoarhound.—This plant is a native of Europe, but also flourishes in this country, growing mostly by the roadside. It is generally used as an infusion, in proportion of about one ounce to a pint of water, to be taken hot for colds. The cold tea is also beneficial in chronic lung troubles. Hoarhound is also used in cough-drops.

White Precipitate is the popular name for ammonio-chloride of mercury, a substance much used in ointment for application to various skin diseases.

Washing Out Stomach is performed for various reasons, particularly in order to remove the narcotic poison that has been recently swallowed before it shall have had time to act, and also to cleanse the stomach in cases where the food tends to collect in the organ and to ferment.

Wax is used in medicine as an ingredient of ointments, plasters, and suppositories. It is used either as yellow wax derived directly from honeycomb, or as white wax, which is the same substance bleached.

Wormwood.—Although this plant is a native of Europe, it has been cultivated in the United States and grows along stone

Wormwood

walls. It is recommended as a stimulant and general tonic. It promotes the appetite and tones up the blood-vessels. In cases of obstinate diarrhea it is given in combination with other drugs. An infusion is made by placing a tablespoonful of the powdered drug in a pint of water.

Yellow Jasmine.—The dose is from two to ten drops. It is used in neuralgia, coughs, whooping-cough, asthma, spasms, and muscular pains. When there is dilatation of the pupil, drooping of the eyelids, and languor caused by its use, it should be discontinued.

Zinc is a metal of which several salts are used in medicine for external application. Its salts fall into two classes: those which are soluble in water, and those which are insoluble. The important soluble salts are the acetate of zinc, sulphate of zinc, and chloride of zinc, of which the first two, in a concentrated form, are powerfully irritating, while the third corrodes any tissues with which it comes in contact. All, and especially the chloride, are powerful antiseptics. The insoluble salts that are of importance are the oxide and carbonate, which have simply an astringent action.

The acetate or the sulphate of zinc is much used in the strength of about two grains to each ounce of water, to form a lotion for inflammation of the eyes or an astringent douche. Oxide of zinc and carbonate of zinc, also known as calamine, are made up in dusting powders, in ointments, or suspended in water as lotions for the astringent action they exert upon abraded surfaces of the skin. Internally, oxide of zinc is frequently administered in pills designed to exert an astringent action on the bowels. Sulphate of zinc, administered in doses of twenty grains in water, forms a valuable emetic.

PREPARATION OF HERBS

Infusions.—These are made by steeping one ounce of the part of the plant to be used, thoroughly beaten, to each pint of boiling water. Cover and let stand for half an hour, then strain. Infusions should be made fresh at least twice a week.

Decoctions, with but few exceptions, are made by adding one pint of boiling water to each ounce of the part of the plant to be

used, and should be boiled on a very slow fire for twenty or thirty minutes; allow to cool and then strain.

Tinctures should be made from fresh plants, one ounce to each pint of alcohol. The plant should be thoroughly pounded before adding the alcohol, and placed in an air-tight jar for from one to two weeks. It should be shaken quite often.

Essences are made by adding one pint of alcohol to each ounce of essential oils.

Leaves should be plucked from a plant while it is still in bloom, and should be dried in an airy room.

Roots.—The proper time to gather roots is in the spring or the fall of the year.

Flowers.—These may be gathered at any time of the year when in bloom and dried in a well ventilated room.

Barks should be taken from the tree in the early spring or late fall and stored in a dry, dark place.

Seeds can be gathered any time they become ripe.

Herbs should be gathered only when they are in bloom.

PHARMACEUTICAL

STANDARD MEDICAL PRESCRIPTIONS

ABSCESSES

LATIN	ENGLISH
℞ Ceratum Resinæ.....one ounce	℞ Resin Cerate.....one ounce
SIG.: External use.	DIRECTIONS: Spread a small amount on clean linen and apply to abscess.
℞ Tab. Calc. Sulphid...each ¼ grain	℞ Sulphide of Lime quarter-grain tablets
SIG.: One t. i. d.	DOSE: One tablet three times a day.

ACNE—PIMPLES

LATIN	ENGLISH
℞ Potass. Sulphur.....one drachm	℞ Sulphide of Potash one teaspoonful
Zinc Sulphate.....one drachm	Sulphate of Zinc..one teaspoonful
Aqua Rosæ.....three ounces	Rose-water.....six tablespoonfuls
Misce.	Mix.
SIG.: External use.	DIRECTIONS: Apply to affected part.

APPETITE (LOSS OF)

LATIN	ENGLISH
℞ Tr. Gentian Comp.....two ounces	℞ Compound Tincture of Gentian four tablespoonfuls
Elix. Simplex.....two ounces	Simple Elixir..four tablespoonfuls
Misce.	Mix.
SIG.: One drachm t. i. d.	DOSE: One teaspoonful in water three times a day, half an hour before meals.

NOTE: The doses given in this department are for adults unless otherwise specified. Proportionate doses for children are given on pages 551 and 552.

ASTHMA

LATIN	ENGLISH
℞ Tr. Lobelia.....one drachm	℞ Tincture of Lobelia one teaspoonful
Tr. Hyoscyamus.....two drachms	Tincture of Hyoscyamus two teaspoonfuls
Spt. Aeth. Nitr.....half ounce	Sweet Spirits of Niter one tablespoonful
Aqua Chloroform.....two ounces	Chloroform-water four tablespoonfuls
Misce.	Mix.
SIG.: One drachm q. 4 h.	DOSE: One teaspoonful in water every four hours.

Or:

℞ Soda Brom.....one drachm Potass. Iodid.....half drachm	℞ Bromide of Soda..one teaspoonful Iodide of Potash one-half teaspoonful
Aqua Anisi.....two ounces	Anise-water...four tablespoonfuls
Misce.	Mix.
SIG.: One drachm t. i. d.	DOSE: One teaspoonful in water three times a day.

BILIOUSNESS

LATIN	ENGLISH
℞ Hydrarg. Chlor. Mite tablet ¼ grain	℞ Calomel.....quarter-grain tablets
SIG.: One q. 4 h.	DOSE: One tablet every four hours, following with a dose of magnesia the next morning.

Or:

℞ Pulv. Jalap. Comp....one drachm	℞ Compound Jalap Powder five-grain capsules
Divide into twelve capsules.	
SIG.: One q. 4 h.	DOSE: One capsule every four hours

BLEEDING FROM LUNGS

LATIN	ENGLISH
℞ Fluidextract Ergotæ....one ounce	℞ Fluidextract of Ergot two tablespoonfuls
SIG.: One drachm q. 2 h.	DOSE: One teaspoonful in water every two hours.

Or:

℞ Ol. Terebinth.....half ounce	℞ Oil of Turpentine one tablespoonful
SIG.: Five minims q. 2 h.	DOSE: Five drops on a lump of sugar, every two hours.

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BOILS

LATIN	ENGLISH
℞ Phenyl Salicylate.....one drachm	℞ Salol.....one teaspoonful
Divide into twelve capsules.	Divide into twelve capsules.
SIG.: One t. i. d.	DOSE: One capsule three times a day.
Or:	
℞ Fluidextract Cascara...half ounce	℞ Fluidextract Cascara one tablespoonful
Mistura Rhei et Sodæ..three ounces	Rhubarb and Soda Mixture six tablespoonfuls
Misce.	Mix.
SIG.: One drachm t. i. d.	DOSE: One teaspoonful in water three times a day.

BRONCHITIS (ACUTE)

LATIN	ENGLISH
℞ Syr. Ipecac.....two drachms	℞ Syrup of Ipecac..two teaspoonfuls
Syr. Pruni Virg.....two ounces	Syrup of Wild Cherry four tablespoonfuls
Syr. Tolu.....one ounce	Syrup of Tolu..two tablespoonfuls
Misce.	Mix.
SIG.: One drachm q. 3 h.	DOSE: One teaspoonful in water every three hours.

BRONCHITIS (CHRONIC)

LATIN	ENGLISH
℞ Ammon. Carb.....half drachm	℞ Carbonate of Ammonia one-half teaspoonful
Pulv. Ext. Glycyrrh...one drachm	Powdered Licorice Root one teaspoonful
Spt. Aeth. Nitr.....half ounce	Sweet Spirits of Niter one tablespoonful
Syr. Tolu.....two ounces	Syrup of Tolu..four tablespoonfuls
Aqua Menth. Pip.....one ounce	Peppermint-water two tablespoonfuls
Misce.	Mix.
SIG.: One drachm q. 2 h.	DOSE: One teaspoonful in water every two hours.

BUNIONS

LATIN	ENGLISH
℞ Tinct. Aconite.....two drachms	℞ Tincture of Aconite two teaspoonfuls
Tinct. Iodine.....two drachms	Tincture of Iodine two teaspoonfuls
Misce.	Mix.
SIG.: External use.	DIRECTIONS: Apply to part with soft brush.

NOTE: The doses given in this department are for adults unless otherwise specified. Proportionate doses for children are given on pages 551 and 552.

BURNS

LATIN

℞ Ung. Acid Boric.....two ounces
Sig.: Apply locally.

ENGLISH

℞ Boric Acid Ointment.
Directions: Spread on linen and apply to burned area.

Or:

℞ Ol Lini.....three ounces
Aqua Calcis.....three ounces
Misce.
Sig.: Apply locally.

℞ Linseed-oil.....six tablespoonfuls
Lime-water.....six tablespoonfuls
Mix.
Directions: Pour over burned surface.

CARBUNCLES

LATIN

℞ Resorcin.....half drachm
Ung. Resin Cerat.....one ounce
Misce.
Sig.: Apply locally.

ENGLISH

℞ Resorcin.....one-half teaspoonful
Resin Cerate Ointment..one ounce
Mix.
Directions: Spread on clean linen and apply to carbuncle.

℞ Potass. Iodid.....two drachms
Syr. Sarsap. Com.....three ounces
Misce.
Sig.: One drachm t. i. d.

℞ Iodide of Potash..two teaspoonfuls
Compound Syrup Sarsaparilla six tablespoonfuls
Mix.
Dose: One teaspoonful in water three times a day.

CATARRH OF NOSE

LATIN

℞ Natrium Chloride.....three ounces
Soda Bibor.....half ounce
Soda Bicarb.....half ounce
Misce.
Sig.: One drachm to pint warm water and snuff up nose.

ENGLISH

℞ Salt.....six tablespoonfuls
Borax.....one tablespoonful
Bicarbonate of Soda one tablespoonful
Mix.
Directions: One teaspoonful to a pint of warm water, and snuff up the nostrils.

CATARRH OF THROAT

LATIN

℞ Soda Bicarb.....one drachm
Soda Bibor.....one drachm
Glycerin.....one-half ounce
Aqua Rosæ.....three ounces
Misce.
Sig.: Use locally in throat.

ENGLISH

℞ Bicarbonate of Soda one teaspoonful
Borax.....one teaspoonful
Glycerine.....one tablespoonful
Rose-water.... six tablespoonfuls
Mix.
Directions: Use in atomizer and spray the throat freely.

Note: The doses given in this department are for adults unless otherwise specified. Proportionate doses for children are given on pages 551 and 552

CHILBLAINS

LATIN

℞ Pulv. Camphor.....one drachm
Menthol.....half drachm
Spt. Vini Rect.....half ounce
Misce.
SIG.: Apply locally.

ENGLISH

℞ Camphor.....one teaspoonful
Menthol.....one-half teaspoonful
Alcohol.....one tablespoonful
Mix.
DIRECTIONS: Paint affected part with camel's-hair brush.

Or:

℞ Resorcin.....half drachm
Spt. Camphor.....two ounces
Misce.
SIG.: Apply locally.

℞ Resorcin.....one-half teaspoonful
Spirits of Camphor
four tablespoonfuls
Mix.
DIRECTIONS: Paint affected part with camel's-hair brush.

CHOLERA INFANTUM

LATIN

℞ Tinct. Opii Camph....one drachm
Tinct. Card. Co.....one drachm
Bism. Subnit.....one drachm
Syr. Acacia.....two ounces
Misce.
SIG.: One drachm q. 2 h.

ENGLISH

℞ Paregoric.....one teaspoonful
Comp. Tinct. of Cardamom
one teaspoonful
Subnitrate of Bismuth
one teaspoonful
Syrup of Acacia
four tablespoonfuls
Mix.
DOSE: One teaspoonful in water every two hours.

CHOLERA MORBUS

LATIN

℞ Piper Niger.....three drachms
Chloride Sodium.....four drachms
Acetum.....two ounces
Aqua .....two ounces
Misce.
SIG.: One tablespoonful every hour.

ENGLISH

℞ Black Pepper...three teaspoonfuls
Common Salt....one tablespoonful
Vinegar.....one-half teacupful
Water.....one-half teacupful
Mix.
DOSE: One tablespoonful every hour.

Or:

℞ Spt. Aeth. Nitr.....one drachm
Spt. Camphor.....one drachm
Tinct. Opii Camph....one drachm
Aqua Chloroformi.....two ounces
Misce.
SIG.: One drachm q. 2 h.

℞ Sweet Spirits of Niter
one teaspoonful
Spirits of Camphor
one teaspoonful
Paregoric.....one teaspoonful
Chloroform-water
four tablespoonfuls
Mix.
DOSE: One teaspoonful in water every two hours.

NOTE: The doses given in this department are for adults unless otherwise specified. Proportionate doses for children are given on pages 551 and 552.

COLIC (INFANTILE)

LATIN	ENGLISH
℞ Tinct. Hyoscyamus....one drachm	℞ Tincture of Hyoscyamus one teaspoonful
Tinct. Opii Camph....one drachm	Paregoric.....one teaspoonful
Syr. Rhei. Arom.....half ounce	Aromatic Syrup of Rhubarb one tablespoonful
Syr. Limonis.....two ounces	Syrup of Lemons four tablespoonfuls
Misce.	Mix.
SIG.: One drachm q. 2 h.	DOSE: One teaspoonful in water every two hours.

CONSTIPATION

LATIN	ENGLISH
℞ Fluidextract Cascara Sagrada two ounces	℞ Fluidextract of Cascara Sagrada four tablespoonfuls
Fluidextract Senna....one drachm	Fluidextract of Senna one teaspoonful
Glycerin.....half ounce	Glycerine.....one tablespoonful
Misce.	Mix.
SIG.: One drachm A.M. and P.M.	DOSE: One teaspoonful in water morning and night.
Or:	
℞ Ol. Mineralis.....six ounces	℞ Mineral Oil.....six ounces
SIG.: Half ounce at night.	DOSE: One tablespoonful at night.
Or:	
℞ Pot. et Soda Tart.....two ounces	℞ Rochelle Salts..four tablespoonfuls
Magn. Sulphate.....two ounces	Epsom Salts...four tablespoonfuls
Soda Sulphate.....one ounce	Glauber's Salts..two tablespoonfuls
Misce.	Mix.
SIG.: Half ounce in A.M.	DOSE: One tablespoonful in hot water each morning.

CONVULSIONS (INFANTILE)

LATIN	ENGLISH
℞ Brom. Sod.....one drachm	℞ Bromide of Soda..one teaspoonful
Tinct. Hyoscyamus...two drachms	Tincture of Hyoscyamus two teaspoonfuls
Tinct. Belladonna....two drachms	Tincture of Belladonna two teaspoonfuls
Chloroformi.... .....two ounces	Chloroform-water four tablespoonfuls
Misce.	Mix.
SIG.: One drachm q. 2 h.	DOSE: One teaspoonful in water every two hours.

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CORNS

LATIN

℞ Ung. Ac. Salicylic 1%..half ounce

Sig.: External use.

ENGLISH

℞ Salicylic Acid, one-per-cent. Ointment.....one-half ounce

Directions: Apply to corns each night.

CORYZA—COLD IN THE HEAD

LATIN

℞ Acetphenetidin.....fifteen grains
Phenyl Salicylate..forty-five grains
Acetyl. Ac. Salicylic
seventy-five grains

Misce, and divide into fifteen capsules.

Sig.: One q. 3 h.

ENGLISH

℞ Phenacetine.....fifteen grains
Salol.....forty-five grains
Aspirin.....seventy-five grains

Mix, and divide into fifteen capsules.

Dose: One capsule every three hours.

CROUP

LATIN

℞ Syr. Ipecac.....three drachms
Mel.....six drachms
Aqua.....three ounces
Misce.

Sig.: One drachm every hour for children.

ENGLISH

℞ Syrup Ipecac...three teaspoonfuls
Honey.....three tablespoonfuls
Water.....six tablespoonfuls
Mix.

Dose: One teaspoonful every hour for children.

Or:

℞ Spt. Aeth. Nitr.....half ounce
Syr. Ipecac.....half ounce
Syr. Scillæ.....two drachms
Syr. Tolu.....two ounces
Misce.

Sig.: One drachm q. 3 h. for children.

℞ Sweet Spirits of Niter
one tablespoonful
Syrup of Ipecac
one tablespoonful
Syrup of Squill
two teaspoonfuls
Syrup of Tolu..four tablespoonfuls
Mix.

Dose: One teaspoonful in water every three hours for children.

DIARRHEA (ACUTE)

LATIN

℞ Bism. Subcarb.....half ounce
Cerium Oxal.....two drachms
Tr. Opii Camph.....two drachms
Syr. Acacia.....three ounces
Misce.

Sig.: One drachm p. r. n.

ENGLISH

℞ Subcarbonate of Bismuth
one tablespoonful
Oxalate of Cerium
two teaspoonfuls
Paregoric.....two teaspoonfuls
Acacia Syrup...six tablespoonfuls
Mix.

Dose: One teaspoonful in water when necessary.

Note: The doses given in this department are for adults unless otherwise specified. Proportionate doses for children are given on pages 551 and 552.

DIARRHEA (CHRONIC)

LATIN	ENGLISH
℞ Tinct. Krameria.....two drachms	℞ Tincture of Krameria two teaspoonfuls
Fluidextract Ergotæ....half ounce	Fluidextract of Ergot one tablespoonful
Misce.	Mix.
SIG.: One drachm q. 3 h.	DOSE: One teaspoonful in water every three hours.

DIPHTHERIA

LATIN	ENGLISH
℞ Potass. Chlor.....half drachm	℞ Chlorate of Potash one-half teaspoonful
Tinct. Ferri Chlor....two drachms	Tincture of Iron..two teaspoonfuls
Glycerin.....half ounce	Glycerine.....one tablespoonful
Aqua Anisi.....two ounces	Anise-water....four tablespoonfuls
Misce.	Mix.
SIG.: External use.	DIRECTIONS: Apply to throat.
Or:	
℞ Resorcin.....two drachms	℞ Resorcin.....two teaspoonfuls
Spt. Vini Rect.....half ounce	Alcohol.....one tablespoonful
Misce.	Mix.
SIG.: Apply locally.	DIRECTIONS: Paint affected part of throat with camel's-hair brush.

DYSENTERY (ACUTE)

LATIN	ENGLISH
℞ Bismuth Subcarb.....half ounce	℞ Subcarbonate of Bismuth one tablespoonful
Cerium Oxal.....half ounce	Oxalate of Cerium one tablespoonful
Magnesia Carb.....one ounce	Carbonate of Magnesia two tablespoonfuls
Misce.	Mix.
SIG.: One drachm q. 2 h.	DOSE: One teaspoonful in water every two hours.

DYSENTERY (CHRONIC)

LATIN	ENGLISH
℞ Vini Ipecac.....one drachm	℞ Wine of Ipecac....one teaspoonful
Tr. Opii Camph.....two drachms	Paregoric.....two teaspoonfuls
Syr. Acacia.....three ounces	Syrup of Acacia.six tablespoonfuls
Misce.	Mix.
SIG.: One drachm q. 3 h.	DOSE: One teaspoonful in water every three hours.

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DYSPEPSIA (FLATULENT)

LATIN	ENGLISH
℞ Spt. Menth. Pip.....half ounce	℞ Essence of Peppermint one tablespoonful
Tinct. Zingiber.....half ounce	Essence of Jamaica Ginger one tablespoonful
Misce.	Mix.
SIG.: Fifteen minims in syrup.	DOSE: Fifteen drops in sweetened water.

DYSPEPSIA (GASTRIC)

LATIN	ENGLISH
℞ Ac. Hydrochlor.....half ounce	℞ Hydrochloric Acid one tablespoonful
Ess. Pepsinæ.....three ounces	Essence of Pepsine six tablespoonfuls
Misce.	Mix.
SIG.: One drachm p. c.	DOSE: One teaspoonful in water after meals.

DYSPEPSIA (NERVOUS)

LATIN	ENGLISH
℞ Brom. Sod.....half ounce	℞ Bromide of Soda..one tablespoonful
Elix. Simplex.....two ounces	Simple Elixir..four tablespoonfuls
Misce.	Mix.
SIG.: One drachm a. c.	DOSE: One teaspoonful in water before meals.

EARACHE

LATIN	ENGLISH
℞ Phenolis liquid.....ten minims	℞ Carbolic Acid.....ten drops
Tr. Belladonna.....fifteen minims	Tincture of Belladonna fifteen drops
Glycerin.....half ounce	Glycerine.....one tablespoonful
Misce.	Mix.
SIG.: Drops for ear.	DIRECTIONS: Drop two drops into the ear.

ERYSIPELAS

LATIN	ENGLISH
℞ Ung. Phenolis.....two ounces	℞ Carbolic Ointment.....two ounces
Liq. Plumbi Subacet...one drachm	Goulard's Extract..one teaspoonful
Misce.	Mix.
SIG.: External use.	DIRECTIONS: Apply over affected area.

NOTE: The doses given in this department are for adults unless otherwise specified. Proportionate doses for children are given on pages 551 and 552.

EYE-WASH

LATIN

℞ Ac. Boric.....half drachm
Aqua Rosæ.....one ounce
Aqua Distil.....four ounces
Misce.
SIG.: Eye-wash.

ENGLISH

℞ Boric Acid....one-half teaspoonful
Rose-water.....two tablespoonfuls
Distilled Water
eight tablespoonfuls
Mix.
DIRECTIONS: Use as eye-wash every two hours.

FEET (SWEATING)

LATIN

℞ Sol. Potass. Permang. 1%
eight ounces
SIG.: External use.

ENGLISH

℞ Permanganate Potash, one-per-cent. Solution.....one-half pint
DIRECTIONS: Add four ounces to a basin of water and bathe the feet.

FLATULENCE

LATIN

℞ Tr. Zingiber.....half ounce
Syr. Rhei.....half ounce
Fluidextract Cascara..four ounces
Misce.
SIG.: One drachm q. 3 h.

ENGLISH

℞ Tincture of Jamaica Ginger
one tablespoonful
Syrup of Rhubarb
one tablespoonful
Fluidextract of Cascara
eight tablespoonfuls
Mix.
DOSE: One teaspoonful in water every three hours.

GOUT

LATIN

℞ Vin. Colchici.....two drachms
Pot. Iodide.....two drachms
Elixir Simplex.....three ounces
Misce.
SIG.: One drachm t. i. d.

ENGLISH

℞ Wine of Colchicum
two teaspoonfuls
Iodide of Potash..two teaspoonfuls
Simple Elixir...six tablespoonfuls
Mix.
DOSE: One teaspoonful in water three times a day.

GRAVEL

LATIN

℞ Fluidextract Buchu....half ounce
Potass. Bicarb.....half ounce
Elixir Simplex.....three ounces
Misce.
SIG.: One drachm t. i. d.

ENGLISH

℞ Fluidextract of Buchu
one tablespoonful
Bicarbonate of Potash
one tablespoonful
Simple Elixir...six tablespoonfuls
Mix.
DOSE: One teaspoonful in water three times a day.

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HAY FEVER

LATIN	ENGLISH
℞ Sol. Adrenali 1-10,000..half ounce	℞ Adrenalin Solution, 1-10,000 one tablespoonful
Sig.: Spray nose.	Directions: Use in atomizer and spray the nostrils every three hours.
Or:	
℞ Pulv. Acid Borici.....one ounce	℞ Boric Acid.....one ounce
Sig.: Use in nose.	Directions: Snuff up the nostrils.

HEADACHE (BILIOUS)

LATIN	ENGLISH
℞ Pulv. Jalap. Co.....twenty grains	℞ Compound Jalap Powder twenty grains
Brom. Sod.....half drachm	Bromide of Soda one-half teaspoonful
Misce.	Mix.
Sig.: One dose at night.	Directions: Take as one dose at night.

HEADACHE (NERVOUS)

LATIN	ENGLISH
℞ Potass. Brom.....thirty grains	℞ Bromide of Potash...thirty grains
Caffein Citrat.....ten grains	Citrate of Caffeine.....ten grains
Misce, and divide into three powders.	Mix, and divide into three powders.
Sig.: One powder p. r. n.	Dose: One powder when necessary.

HEARTBURN

LATIN	ENGLISH
℞ Magn. Calc.....one ounce	℞ Calcined Magnesia.....one ounce
Bicarb. Soda.....two ounces	Bicarbonate of Soda...two ounces
Ess. Menth. Pip.....half drachm	Essence of Peppermint one-half teaspoonful
Misce.	Mix.
Sig.: One drachm p. c.	Dose: One teaspoonful in water after meals.

HICCOUGH

LATIN	ENGLISH
℞ Tinct. Belladonna....half drachm	℞ Tincture of Belladonna one-half teaspoonful
Spt. Aeth. Nitr..... half ounce	Sweet Spirits of Niter one tablespoonful
Misce.	Mix.
Sig.: One drachm q. h.	Dose: One teaspoonful in water every hour.

HOARSENESS

LATIN	ENGLISH
℞ Tr. Benz. Co.....one ounce	℞ Comp. Tincture of Benzoin two tablespoonfuls
Sig.: Use by inhalation.	Directions: One teaspoonful in pint of boiling water, and inhale fumes.

Note: The doses given in this department are for adults unless otherwise specified. Proportionate doses for children are given on pages 551 and 552.

INFLAMMATION OF BOWELS

LATIN	ENGLISH
℞ Phenyl Salicylate.....half ounce Bism. Subnit.....one ounce Misce. Sig.: One drachm in aqua t. i. d.	℞ Salol.....one tablespoonful Subnitrate of Bismuth..one ounce Mix. Dose: One teaspoonful in water three times a day.

INFLAMMATION OF BREAST

LATIN	ENGLISH
℞ Glycer. Tannin.....one ounce Aqua Rosæ.....three ounces Misce. Sig.: Apply locally.	℞ Glycerite of Tannin....one ounce Rose-water.....three ounces Mix. Directions: Apply to affected part.

INFLAMMATION OF KIDNEYS

LATIN	ENGLISH
℞ Potass. Acet.....two drachms Potass. Citrat.....two drachms Aqua Menth. Pip....three ounces Misce. Sig.: One drachm q. 3 h.	℞ Acetate of Potash two teaspoonfuls Citrate of Potash two teaspoonfuls Peppermint-water six tablespoonfuls Mix. Dose: One teaspoonful in water every three hours.

Or:

℞ Liq. Ferri et Ammon. Acet. four ounces Sig.: Two drachms q. 3 h.	℞ Basham's Mixture eight tablespoonfuls Dose: Two teaspoonfuls in water every three hours.

INFLUENZA—LA GRIPPE

LATIN	ENGLISH
℞ Camphoric Acid.....half drachm Divide into six capsules. Sig.: One q. 4 h.	℞ Camphoric Acid.....thirty grains Divide into six capsules. Dose: One capsule every four hours.

Or:

℞ Phenyl Salicyl.....half drachm Acetphenetidin.....half drachm Misce, and divide into twelve capsules.	℞ Salol.....thirty grains Phenacetine.....thirty grains Mix, and divide into twelve capsules.

Dose: One capsule every three hours for three doses.

Note: The doses given in this department are for adults unless otherwise specified. Proportionate doses for children are given on pages 551 and 552.

JAUNDICE

LATIN	ENGLISH
℞ Hydrarg. Chlor. Mite..half drachm Aloini.....five grains Pulv. Jalap Comp.....one drachm	℞ Calomel.....thirty grains Aloine.....five grains Compound Jalap Powder one teaspoonful
Misce, and divide into twelve powders.	Mix, and divide into twelve powders.
Sig.: One powder t. i. d.	Dose: One powder three times a day.

LUMBAGO

LATIN	ENGLISH
℞ Potass. Iodide.....two drachms Potass. Bicarb.....four drachms	℞ Iodide of Potash..two teaspoonfuls Bicarbonate of Potash four teaspoonfuls
Tr. Aconite.....one drachm	Tincture of Aconite one teaspoonful
Aqua Anise.....three ounces	Aniseed-water...six tablespoonfuls
Misce.	Mix.
Sig.: One drachm q. 4 h.	Dose: One teaspoonful in water every four hours.
℞ Lin. Chloroformi.....three ounces Spt. Camphor.....one ounce	℞ Chloroform Liniment..three ounces Spirits of Camphor.....one ounce
Misce.	Mix.
Sig.: Local use.	Directions: Apply to affected part.
Or:	
℞ Methyl Salicylate.....one ounce	℞ Oil of Wintergreen two tablespoonfuls
Sig.: External use.	Directions: Rub over painful area.

MALARIA

LATIN	ENGLISH
℞ Elix. Ferri, Quin. et Strych. three ounces	℞ Elixir of Iron, Quinine, and Strychnine.....six tablespoonfuls
Sig.: One drachm t. i. d.	Dose: One teaspoonful in water three times a day
Or:	
℞ Quin. Hydrobrom.....one drachm	℞ Hydrobromide of Quinine one teaspoonful
Divide into twelve capsules.	Divide into twelve capsules.
Sig.: One q. 3 h.	Dose: One capsule every three hours.

Note: The doses given in this department are for adults unless otherwise specified. Proportionate doses for children are given on pages 551 and 552.

MARASMUS

LATIN	ENGLISH
℞ Liq. Potass. Arsenitis..half ounce	℞ Fowler's Solution one tablespoonful
Sig.: Three minims 3 t. i. d.	Dose: Three drops in water three times a day.
	Or:
℞ Syr. Ferri Iodid....three drachms	℞ Syrup of Iodide of Iron three teaspoonfuls
Ol. Morrhuæ.....four ounces	Cod-liver Oil..eight tablespoonfuls
Misce.	Mix.
Sig.: One drachm p. c.	Dose: One teaspoonful in water after meals.

MEASLES

LATIN	ENGLISH
℞ Tr. Aconite.....half drachm	℞ Tincture of Aconite one-half teaspoonful
Tr. Belladonna.....one drachm	Tincture of Belladonna one teaspoonful
Pot. Acet.....two drachms	Acetate of Potash two teaspoonfuls
Syr. Limonis.....three ounces	Syrup of Lemons six tablespoonfuls
Misce.	Mix.
Sig.: One drachm q. 3 h.	Dose: One teaspoonful in water every three hours.

MEASLES (LOCAL TREATMENT)

LATIN	ENGLISH
℞ Phenolis Liq.....ten minims	℞ Carbolic Acid.....ten drops
Ung. Ac. Boric.....one ounce	Boric Acid Ointment....one ounce
Misce.	Mix.
Sig.: Local use.	Directions: Apply lightly to the skin.

MUMPS

LATIN	ENGLISH
℞ Guaiacolis.....one drachm	℞ Guaiacol.....one teaspoonful
Ol. Camphora.....two ounces	Camphorated Oil four tablespoonfuls
Misce.	Mix.
Sig.: External use.	Directions: Apply over affected area.
℞ Liq. Potass. Arsen....one drachm	℞ Fowler's Solution one teaspoonful
Syr. Ferri Iodid.....two drachms	Syrup of Iodide of Iron two teaspoonfuls
Elix. Simp.....three ounces	Simple Elixir...six tablespoonfuls
Misce.	Mix.
Sig.: One drachm t. i. d.	Dose: One teaspoonful in water three times a day.

Note: The doses given in this department are for adults unless otherwise specified. Proportionate doses for children are given on pages 551 and 552.

NEURALGIA

LATIN	ENGLISH
℞ Mentholis.....ten grains Camphora.....ten grains Petrol Albo.....one ounce	℞ Menthol.....ten grains Camphor.....ten grains White Vaseline.....one ounce
Misce. Sig.: External use.	Mix. Directions: Apply to painful area.
℞ Acid Acetylsalicylic...one drachm Acetphenetidin.....half drachm Misce, and divide into twelve capsules.	℞ Aspirin.....one teaspoonful Phenacetine...one-half teaspoonful Mix, and divide into twelve capsules.

Dose: One capsule every three hours for three doses.

PALPITATION OF HEART

LATIN	ENGLISH
℞ Pot. Brom.....two drachms	℞ Bromide of Potash two teaspoonfuls
Ammon. Brom.....two drachms	Bromide of Ammonia two teaspoonfuls
Aqua Chloroformi....three ounces	Chloroform-water six tablespoonfuls
Misce. Sig.: One drachm q. 3 h.	Mix. Dose: One teaspoonful in water every three hours.

PILES

LATIN	ENGLISH
℞ Ac. Tannic.....one drachm Ung. Zinc Oxide.....one ounce	℞ Tannic Acid.....one teaspoonful Zinc Ointment.....one ounce
Misce. Sig.: External use.	Mix. Directions: Apply to affected area.

PLEURISY

LATIN	ENGLISH
℞ Tr. Aconite.....half ounce	℞ Tincture of Aconite one tablespoonful
Tr. Iodine.....half ounce	Tincture of Iodine one tablespoonful
Misce. Sig.: External use only.	Mix. Directions: Paint on painful area.
Or:	
℞ Lin. Ammoniac.....two ounces Lin. Chloroformi.....two ounces	℞ Ammonia Liniment....two ounces Chloroform Liniment...two ounces
Misce. Sig.: Local use.	Mix. Directions: Rub on the painful part.

Note: The doses given in this department are for adults unless otherwise specified. Proportionate doses for children are given on pages 551 and 552.

PNEUMONIA

LATIN	ENGLISH
℞ Ac. Camphoric.....one drachm	℞ Camphoric Acid...one teaspoonful
Divide into twelve capsules.	Divide into twelve capsules.
SIG.: One q. 4 h.	DOSE: One capsule every four hours.

PRICKLY HEAT

LATIN	ENGLISH
℞ Sod. Bicarb.....three drachms	℞ Bicarbonate of Soda three teaspoonfuls
Sod. Bibor.....two drachms	Borax.....two teaspoonfuls
Aqua Rosæ.....three ounces	Rose-water.....six tablespoonfuls
Misce.	Mix.
SIG.: Local use.	DIRECTIONS: Apply to the affected area with a piece of linen.
Or:	
℞ Lotio Calamin.....four ounces	℞ Calamine Lotion eight tablespoonfuls
Phenolis Liq.....ten minims	Carbolic Acid.....ten drops
Misce.	Mix.
SIG.: External use.	DIRECTIONS: Apply to the affected area with a piece of linen.

PYEMIA

LATIN	ENGLISH
℞ Ol. Turpen. Rect.....two drachms	℞ Rectified Oil of Turpentine two teaspoonfuls
Elix. Simplex.....two ounces	Simple Elixir..four tablespoonfuls
Misce.	Mix.
SIG.: One drachm q. 3 h.	DOSE: One teaspoonful in water every three hours.

RHEUMATISM (ACUTE)

LATIN	ENGLISH
℞ Soda Salicylate.....one drachm	℞ Salicylate of Soda..one teaspoonful
Acetphenetidin.....half drachm	Phenacetine...one-half teaspoonful
Misce, and divide into twelve capsules.	Mix, and divide into twelve capsules.
SIG.: One capsule every three hours.	DOSE: One capsule every three hours for three doses.

RHEUMATISM (CHRONIC)

LATIN	ENGLISH
℞ Pot. Iodid.....two drachms	℞ Iodide of Potash..two teaspoonfuls
Pot. Acet.....two drachms	Acetate of Potash.two teaspoonfuls
Pot. Bicarb.....three drachms	Bicarbonate of Potash three teaspoonfuls
Tr. Gent. Co.....three ounces	Compound Tincture of Gentian.....six tablespoonfuls
Misce.	Mix.
SIG.: One drachm t. i. d.	DOSE: One teaspoonful in water three times a day.

NOTE: The doses given in this department are for adults unless otherwise specified. Proportionate doses for children are given on pages 551 and 552.

RHEUMATISM (MUSCULAR)

LATIN	ENGLISH
℞ Methyl Salicylate.....one ounce	℞ Oil of Wintergreen two tablespoonfuls
Lin. Chloroformi.....four ounces	Chloroform Liniment eight tablespoonfuls
Misce.	Mix.
Sig.: External use.	Directions: Massage on affected area.

RINGWORM

LATIN	ENGLISH
℞ Phenolis Liq.....ten minims	℞ Carbolic Acid.....ten drops
Ung. Lassar.....one ounce	Lassar Paste.....one ounce
Misce.	Mix.
Sig.: External use.	Directions: Apply to affected part.

SCARLET FEVER

LATIN	ENGLISH
℞ Soda Bicarb.....one drachm	℞ Bicarbonate of Soda one teaspoonful
Soda Bibor.....half drachm	Borax.....one-half teaspoonful
Phenolis Liq.....fifteen minims	Carbolic Acid.....fifteen drops
Glycerin.....half ounce	Glycerine.....one tablespoonful
Aqua Rosæ .....three ounces	Rose-water.....six tablespoonfuls
Misce.	Mix.
Sig.: Dilute in aqua as gargle.	Directions: Mix with equal parts of water and use as a gargle.

SCROFULA

LATIN	ENGLISH
℞ Syr. Ferri Iodid.....two drachms	℞ Syrup of Iodide of Iron two teaspoonfuls
Ol. Morrhuæ.....three ounces	Cod-liver Oil....six tablespoonfuls
Misce.	Mix.
Sig.: One drachm t. i. d.	Dose: One teaspoonful in water three times a day.

SLEEPLESSNESS

LATIN	ENGLISH
℞ Sod. Bromid.....two drachms	℞ Bromide of Soda..two teaspoonfuls
Pot. Bromid.....two drachms	Bromide of Potash two teaspoonfuls
Sod. Salicyl.....three drachms	Salicylate of Soda three teaspoonfuls
Aqua Chloroformi....three ounces	Chloroform-water six tablespoonfuls
Misce.	Mix.
Sig.: One drachm q. 2 h. p. r. n.	Dose: One teaspoonful in water every two hours until relieved.

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SMALLPOX

LATIN

℞ Liq. Ferri et Ammon. Acet. three ounces

Sig.: Half drachm t. i. d.

ENGLISH

℞ Basham's Mixture six tablespoonfuls

Dose: One-half teaspoonful in water three times a day.

SORE EYES

LATIN

℞ Aqua Camphor.....half ounce
Aqua Rosæ.....one ounce
Sat. Sol. Boric Acid...three ounces

Misce.

Sig.: Eye-wash t. i. d.

ENGLISH

℞ Camphor-water..one tablespoonful
Rose-water.....two tablespoonfuls
Boric Acid Solution six tablespoonfuls

Mix.

Directions: Use in eye-cup three times a day.

SORE THROAT—QUINSY

LATIN

℞ Resorcinol.....half drachm
Spt. Vini Rect.....half ounce

Misce.

Sig.: Paint throat A.M. and P.M.

ENGLISH

℞ Resorcin Powder one-half teaspoonful
Alcohol.....one tablespoonful

Mix.

Directions: Paint the throat morning and night.

SORE THROAT (SIMPLE)

LATIN

℞ Tr. Ferri Chlor.....two drachms
Aqua Cinnamon.....four ounces

Misce.

Sig.: Use as gargle t. i. d.

ENGLISH

℞ Tincture of Iron Chloride two teaspoonfuls
Cinnamon-water eight tablespoonfuls

Mix.

Directions: Use as a gargle three times a day.

SPITTING OF BLOOD (FROM LUNGS)

LATIN

℞ Tr. Hydrastis.....two drachms
Fluidextract Ergotæ....half ounce

Misce.

Sig.: One drachm p. r. n.

ENGLISH

℞ Tincture of Hydrastis two teaspoonfuls
Fluidextract of Ergot one tablespoonful

Mix.

Dose: One teaspoonful in water when necessary.

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SPITTING OF BLOOD (FROM STOMACH)

LATIN

℞ Glyc. Ac. Tannic.....one ounce
Aqua Menth. Pip....three ounces
Misce.
SIG.: Two drachms q. h. p. r. n.

ENGLISH

℞ Glycerite of Tannic Acid.one ounce
Peppermint-water.....three ounces
Mix.
DOSE: Two teaspoonfuls in water every hour until hemorrhage stops.

SUPPRESSED MENSES

LATIN

℞ Fluidextract Gossypii...one ounce
Tr. Aloe.....one drachm
Misce.
SIG.: One drachm q. 4 h.

ENGLISH

℞ Fluidextract of Cotton-root
two tablespoonfuls
Tincture of Aloes..one teaspoonful
Mix.
DOSE: One teaspoonful in water every four hours.

TAPEWORM

LATIN

℞ Res. Aspidi.....half drachm
Glycerin.....one ounce
Aqua Mentha Pip.....one ounce
Misce.
SIG.: Full dose at night.

ENGLISH

℞ Resin Malefern
one-half teaspoonful
Glycerine.....two tablespoonfuls
Peppermint-water
two tablespoonfuls
Mix.
DOSE: Take full dose at night.

TETTER

LATIN

℞ Ung. Hyd. ox Flava. 1%
half ounce
SIG.: Apply locally A.M. and P.M.

ENGLISH

℞ Yellow Oxide of Mercury, one-per-cent. Ointment.....one-half ounce
DIRECTIONS: Apply locally twice a day.

TOOTHACHE

LATIN

℞ Guaiacolis.....half drachm
Spt. Chloroformi.....one drachm
Misce.
SIG.: Toothache drops.

ENGLISH

℞ Guaiacol.....one-half teaspoonful
Spirits of Chloroform
one teaspoonful
Mix.
DIRECTIONS: Apply to tooth on absorbent cotton.

VOMITING

LATIN

℞ Cerii Oxal.....one drachm
Bismuth Subnit.....two drachms
Mist. Cretæ.....two ounces
Misce.
SIG.: One drachm q. 3 h.

ENGLISH

℞ Oxalate of Cerium
one teaspoonful
Subnitrate of Bismuth
two teaspoonfuls
Chalk Mixture.....two ounces
Mix.
DOSE: One teaspoonful in water every three hours.

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WATER-BRASH

LATIN

℞ Ac. Hydrochlor. dil....half ounce
Elix. Simplex.....four ounces
Misce.
SIG.: One drachm p. c.

ENGLISH

℞ Dilute Hydrochloric Acid
one tablespoonful
Simple Elixir..eight tablespoonfuls
Mix.
DOSE: One teaspoonful in water after meals.

WETTING THE BED—INCONTINENCE

LATIN

℞ Tr. Capsici.....one drachm
Elix. Iron, Quin. et Strych.
three ounces
Misce.
SIG.: One drachm t. i. d.

ENGLISH

℞ Tincture of Capsici
one teaspoonful
Elixir of Iron, Quinine, and
Strychnine.....six tablespoonfuls
Mix.
DOSE: One teaspoonful in water three times a day.

WHITES—LEUCORRHEA

LATIN

℞ Ac. Tannic.....one ounce
Ac. Boric.....two ounces
Liq. Phenolis.....fifteen minims
Misce.
SIG.: Two drachms in quart aqua for external use.

ENGLISH

℞ Tannic Acid.....one ounce
Boric Acid.....two ounces
Carbolic Acid.....fifteen drops
Mix.
DIRECTIONS: Two teaspoonfuls in a quart of warm water; use as douche.

WHOOPING-COUGH

LATIN

℞ Antipyrine.....one drachm
Syr. Ipecac.....two drachms
Elixir Simplex .....three ounces
Misce.
SIG.: One drachm q. 3 h.

ENGLISH

℞ Antipyrine.....one teaspoonful
Syrup of Ipecac..two teaspoonfuls
Simple Elixir...six tablespoonfuls
Mix.
DOSE: One teaspoonful in water every three hours.

WORMS (ROUND AND STOMACH)

LATIN

℞ Santonini.....six grains
Hydrarg. Chlor. Miti.twelve grains
Misce, and divide into twelve powders
SIG: One powder at night after day of fasting.

ENGLISH

℞ Santonine.....six grains
Calomel.....twelve grains
Mix, and divide into twelve powders.
DOSE: One powder at night after a day of fasting.

NOTE: The doses given in this department are for adults unless otherwise specified. Proportionate doses for children are given on pages 551 and 552.

DICTIONARY OF DRUGS IN LATIN AND ENGLISH

LATIN	ENGLISH
Absinthium	Wormwood.
Acacia	Gum Arabic.
Aceta	Vinegars.
Acetanilidum	Acetanilid.
Acetum Opii	Vinegar of Opium.
Acidum Aceticum	Acetic Acid.
Acidum Arsenosum	Arsenous Acid.
Acidum Benzoicum	Benzoic Acid.
Acidum Boricum	Boric Acid.
Acidum Carbolicum	Carbolic Acid.
Acidum Chromicum	Chromic Acid.
Acidum Citricum	Citric Acid.
Acidum Gallicum	Gallic Acid.
Acidum Hydrocyanicum Dilutum	Prussic Acid.
Acidum Lacticum	Lactic Acid.
Acidum Nitricum	Nitric Acid.
Acidum Oleicum	Oleic Acid.
Acidum Oxalicum	Oxalic Acid.
Acidum Phosphoricum	Phosphoric Acid.
Acidum Salicylicum	Salicylic Acid.
Acidum Sulphurosum	Sulphuric Acid.
Acidum Tannicum	Tannic Acid.
Acidum Tartaricum	Tartaric Acid.
Aconitum	Aconite.
Adeps	Lard.
Æther	Ether.
Alcohol	Alcohol.
Alcohol Dilutum	Diluted Alcohol Spirit.
Allium	Garlic.
Aloe	Aloes.
Alumen	Alum.
Alumine Sulphas	Aluminum Sulphate.
Ammoniacum	Ammoniac.
Ammonii Benzoas	Ammonium Benzoate.
Ammonii Bromidum	Ammonium Bromide.
Ammonii Chloridum	Ammonium Chloride.
Amygdale Amara	Bitter Almond.

LATIN	ENGLISH
Amygdala Dulcis	Sweet Almond.
Amyl Nitris	Amyl Nitrite.
Amylum	Starch.
Anisum	Anise.
Anthemis	Anthemis; Camomile.
Antimonium	Antimony.
Apocynum	Canadian Hemp.
Aqua	Water.
Aqua Chlori	Chlorine Water.
Argenti Nitras	Nitrate of Silver.
Aristolochia Serpentaria	Snakeroot.
Arsenium	Arsenic.
Asafœtida	Asafetida.
Asclepias	Pleurisy-root.
Aspidium	Male-fern.
Atropa Belladonna	Deadly Nightshade.
Aurantii Amara	Bitter Orange.
Balsamum Peruvianum	Balsam Peru.
Balsamum Tolutanum	Balsam Tolu.
Barium	Barium.
Belladonnæ Folia	Belladonna Leaves.
Benzinum	Benzine.
Benzoinum	Benzoin.
Berbinæ Sulphas	Sulphate of Berbine.
Bismuthi Citras	Citrate of Bismuth.
Bismuthi et Ammonii Citras	Citrate of Bismuth and Ammonium.
Bismuthum	Bismuth.
Bromum	Bromine.
Bryonia	Bryonia.
Buchu	Buchu.
Caffeina	Caffeine.
Calamina Præparata	Prepared Calamine.
Calcis Chloridum	Chloride of Lime.
Calcium Carbonas Precip	Precipitate of Chalk.
Calendula	Calendula.
Calx	Lime.
Cambogia	Gamboge.
Camphora	Camphor.
Cannabis	Hemp.
Cantharis	Cantharides; Spanish Flies.
Capsicum	Capsicum.
Carbo Animalis	Animal Charcoal.
Carbo Ligni	Charcoal.
Carum	Caraway.

LATIN	ENGLISH
Caryophyllus	Cloves.
Cascarilla	Cascarilla.
Cassia Fistula	Cassia; Senna.
Catechu	Catechu.
Cephœlis Ipecacuanha	Ipecac.
Cerata	Cerates.
Cetaceum	Spermaceti.
Cetraria	Iceland Moss.
Chelidonium	Celandine.
Chenopodium	American Wormseed.
Chimaphila	Pipsissewa.
Chloral	Hydrate of Chloral.
Chloroformi	Chloroform.
Chondrus	Irish Moss.
Cimicifuga	Black Snakeroot.
Cinchona	Peruvian Bark.
Cinchonina	Cinchonine.
Cinnamomum	Cinnamon.
Cocainæ Hydrochloras	Hydrochlorate of Cocaine.
Coccus	Cochineal.
Codeina	Codeine.
Collodium	Collodion.
Colocynthis	Colocynth.
Conium	Hemlock.
Convolvulus Jalapa	Jalap.
Copaiba	Balsam of Copaiba.
Cornus	Dogwood.
Creosotum	Creosote.
Creta	Chalk.
Crocus	Saffron.
Cubeba	Cubebs.
Cupri Sulphas	Bluestone.
Cuprum	Copper.
Cydonium	Quince-seed.
Cypripedium	Lady's-slipper.
Datura Stramonium	Thorn-apple.
Digitalis	Foxglove.
Dulcamara	Bitter-sweet.
Ergota	Ergot.
Erythroxylon	Coca.
Eucalyptus	Eucalyptus.
Euonymus	Wahoo.
Eupatorium	Thoroughwort.

LATIN	ENGLISH
Ferris Sulphas	Green Vitriol.
Ferrum	Iron.
Ficus	Fig.
Fœniculum	Fennel.
Frangula	Buckthorn.
Galbanum	Galbanum.
Galla	Nutgall.
Gaultheria	Wintergreen.
Gelsemium	Yellow Jasmine.
Gentiana	Gentian.
Glycerinum	Glycerine.
Glycyrrhiza	Licorice-root.
Gossypii Radicis Cortex	Cotton-root Bark.
Gossypium	Purified Cotton; Absorbent Cotton.
Grindelia Robusta	Grindelia.
Guaiaci Lignum	Guaiacum Wood.
Guaiaci Resina	Guaiac.
Guarana	Guarana.
Hæmatoxylon	Logwood.
Hamamelis	Witch-hazel.
Hedeoma	Pennyroyal.
Humulus	Hops.
Hydrargyri Chloridum Corrosivum	Corrosive Chloride of Mercury; Corrosive Sublimate; Mercuric Chloride.
Hydrargyri Cyanidum	Cyanide of Mercury.
Hydrargyri Iodidum Rubrum	Red Iodide of Mercury.
Hydrargyri Iodidum Viride	Green Iodide of Mercury.
Hydrargyri Oxidum Flavum	Yellow Oxide of Mercury.
Hydrargyri Oxidum Rubrum	Red Oxide of Mercury.
Hydrargyri Persulphas	Persulphate of Mercury.
Hydrargyri Subsulphas Flavus	Yellow Subsulphate of Mercury.
Hydrargyri Sulphidum Rubrum	Red Sulphide of Mercury.
Hydrargyrum	Mercury.
Hydrargyrum Ammoniatum	Ammoniated Mercury.
Hydrargyrum cum Creta	Mercury with Chalk.
Hydrastis	Golden-seal.
Hyoscyamus	Henbane.
Ichthyocolla	Isinglass.
Ignatia	Bean of St. Ignatius.
Illicium	Star Anise.
Iodoformum	Iodoform.
Iodum	Iodine.

LATIN	ENGLISH
Ipecacuanha	Ipecac.
Iris	Blue Flag.
Jalapa	Jalap.
Juglans	Butternut.
Juniperus	Juniper.
Kamala	Kamala.
Kino	Kino.
Krameria	Rhatany.
Lactuca	Lettuce.
Lactucarium	Lactucarium.
Lappa	Burdock.
Laurus Camphora	Camphor.
Lavandula	Lavender.
Leptandra	Culver's-root.
Limonis	Lemons.
Limonis Cortex	Lemon Peel.
Limonis Succus	Lemon Juice.
Lini Farina	Flaxseed-meal.
Linum	Flaxseed.
Linum Usitatissimum	Flaxseed.
Liquor Calcis	Lime-water.
Liquor Plumbi Subacetate	Lead-water.
Lithii Benzoas	Benzoate of Lithium.
Lithii Bromidum	Bromide of Lithium.
Lithii Carbonas	Carbonate of Lithium.
Lithii Citras	Citrate of Lithium.
Lithii Salicylas	Salicylate of Lithium.
Lobelia	Lobelia.
Lotio Hydrargyri Nigra	Black Wash.
Lupulinum	Lupuline.
Lycopodium	Lycopodium.
Macis	Mace.
Magnesia	Magnesia.
Magnesia Sulphas	Epsom Salts.
Magnolia	Magnolia.
Maltum	Malt.
Mangani Oxidum Nigrum	Black Oxide of Manganese.
Mangani Sulphas	Sulphate of Manganese.
Manna	Manna.
Marrubium	Hoarhound.
Massa Hydrargyri	Blue Mass Pill.
Mastiche	Mastic.

LATIN	ENGLISH
Matico	Matico.
Mel	Honey.
Melissa	Balm.
Menispermum	Canadian Moonseed.
Mentha Piperita	Peppermint.
Mentha Viridis	Spearmint.
Menthol	Peppermint.
Mistura Cretæ	Chalk Mixture.
Morphinæ	Morphine; Poppy Plant.
Moschus	Musk, from preputial follicles of Musk-ox.
Mucilagio	Mucilage.
Myristica	Nutmeg.
Naphthalenum	Hydrocarbon from Coal-tar.
Nux Vomica	Nux Vomica.
Opium	"Sleep-making Poppy," thick exudation of poppy; Alkaloid, Morphine, Heroine, etc.
Pepo	Pumpkin-seed.
Pepsinum	Pepsine.
Petrolatum Liquidum	Liquid Petroleum.
Phosphorus	Phosphorus.
Physostigma	Calabar-bean.
Phytolaccæ Radix	Pokeroot.
Pilocarpinæ Hydrochloras	Alkaloid of Jaborandi.
Pilocarpus	Jaborandi.
Pimenta	Allspice.
Piper	Black Pepper.
Pix Burgundica	Resin of Burgundy Pine.
Pix Liquida	Pine Tar.
Plumbia Acetas	Lead Acetate, Sugar of Lead.
Plumbum	Lead. Lead combines with several remedies.
Podophyllum	Roots of May Apple.
Potassa	Potash.
Potassa cum Calce	Potassa with Lime.
Potassa Sulphurata	Lime of Sulphur; Sulphurated Potassa.
Potassii Acetas	Potassium Acetate.
Potassii Bicarbonas	Potassium Bicarbonate.
Potassii Bichromas	Potassium Bichromate.
Potassii Bitartras	Cream of Tartar.
Potassii et Sodii Tartras	Rochelle Salts.

LATIN	ENGLISH
Potassii Nitras	Saltpeter.
Prunum	Prune.
Prunus Virginiana	Wild Cherry.
Pulsatilla	Pulsatilla.
Pyrethrum	Pellitory.
Pyroxylinum	Soluble Guncotton.
Quassia	Quassia.
Quercus Alba	White Oak.
Quinine	Alkaloid of Cinchona Bark.
Quinina et Strychninæ Phosphatum	Quinine and Strychnine.
Resina	Resin.
Rhamnus Purshiana	Cascara Sagrada.
Rheum	Rhubarb.
Rhus Glabra	Rhus Glabra; Oak.
Rhus Toxicodendron	"Poison Ivy."
Rosa Centifolia	Pale Rose.
Rubus	Blackberry.
Rubus Idæus	Raspberry.
Rumex	Yellow Dock.
Saccharum Lactus	Sugar of Milk.
Salvia	Sage.
Sambucus	Elder.
Sanguinaria	Bloodroot.
Santalum Rubrum	Red Saunders; Sandalwood.
Sapo	Soap; White Castile prep. Soda and Olive-oil.
Sassafras	Sassafras Root, Bark.
Sassafras Medulla	Sassafras Pith.
Scilla	Squill.
Scutellaria	Skullcap.
Senega	Senega.
Senna	India Senna.
Serpentaria	Virginia Snakeroot.
Sinapis Alba	White Mustard.
Sinapis Nigra	Black Mustard.
Sodii Acetas	Soda and Acetic Acid.
Sodii Arsenas	Soda and Arsenic.
Sodii Benzoas	Benzoate of Soda.
Sodii Bicarbonas	Bicarbonate of Soda.
Sodii Chloridum	Salt.
Sodii Sulphas	Glauber's Salt.
Spigelia	Pinkroot, Indian Pink, Star Grass.
Spiritus	Spirit.
Spiritus Menthæ Viridis	Essence of Spearmint.

LATIN	ENGLISH
Spiritus Myrciæ, Spirit of Myrcia	Bay Rum.
Spiritus Myristicæ	Essence of Nutmeg.
Spiritus Digitalis	Purple Foxglove.
Spiritus Ferri Chloridi	Chloride of Iron.
Spiritus Gallæ	Excrescence of the Gall Oak.
Spiritus Gelsemii	Yellow Jasmine; Woodbine.
Spiritus Guaiaci	South American Guaiac Wood.
Spiritus Humuli	Hops.
Spiritus Hydrastis	Yellow-root; Golden-seal.
Spiritus Hyoscyami	Henbane; Fetid Nightshade; Poison Tobacco.
Spiritus Iodi	Metallic element from Seaweed.
Spiritus Kino	Kino Bark.
Spiritus Krameriæ	South American shrub, Krameria.
Spiritus Lactucarii	Garden Lettuce.
Spiritus Lobeliæ	Lobelia; Indian Tobacco.
Spiritus Matico	August Pepper of Peru.
Spiritus Moschi	Preputial follicles of Musk-deer.
Spiritus Myrrhæ	Myrrh.
Spiritus Nucis Vomicæ	Nux Vomica; Poison Nut of India.
Spiritus Opii	Opium; Laudanum; Poppy Plants. Alkaloids are Morphine, Codeine, Narcotine, Papaverine, Thebaine, Laudamine, etc.
Spiritus Physostigmatis	Calabar Bean.
Spiritus Pyrethri	Pellitory-root; Spanish Camomile.
Spiritus Quassiæ	Quassia.
Spiritus Quillajæ	Soap-bark Tree.
Spiritus Rhei	Rhubarb.
Sodii Chloridum	Salts.
Sodii et Potassii Tartras	Rochelle Salts.
Sodii Phosphas	Phosphate of Soda.
Sodii Sulphas	Glauber's Salts.
Stillingia	Queen's-root.
Stramonii Folia	Stramonium Leaves.
Stramonii Semen	Stramonium Seed.
Strychnina	Strychnine.
Sulphur Lotum	Washed Sulphur.
Sulphur Præcipitatum	Precipitated Sulphur.
Sulphur Rotundum	Brimstone.
Sulphur Sublimatum	Sublimed Sulphur.
Sulphuris Iodidum	Iodide of Sulphur.
Syrupus Acaciæ	Syrup of Gum Arabic.
Syrupus Acidi Citrici	Syrup of Citric Acid.
Syrupus Acidi Hydriodici	Syrup of Hydriodic Acid.
Syrupus Allii	Syrup of Garlic.

LATIN	ENGLISH
Syrupus Altheæ	Syrup of Althea.
Syrupus Aurantii	Syrup of Orange.
Syrupus Calcii Lactophosphatis	Syrup of Lactaphosphate of Calcium.
Syrupus Ferri Bromidi	Syrup of Bromide of Iron.
Syrupus Ferri Iodidi	Syrup of Iodide of Iron.
Syrupus Ferri Phosphatis	Syrup of Phosphate of Iron.
Syrupus Ferri Quininæ	Syrup of the Phosphates of Iron.
Syrupus Hypophosphitum	Syrup of Hypophosphites.
Syrupus Hypophosphitum cum Ferro	Syrup of Hypophosphites with Iron.
Syrupus Ferri Quininæ et Strychninæ Phosphatum	Syrup of the Phosphates of Iron, Quinine, and Strychnine.
Syrupus Ipecacuanhæ	Syrup of Ipecac.
Syrupus Krameriæ	Syrup of Krameria.
Syrupus Lactucarii	Syrup of Lactucarium.
Syrupus Limonis	Syrup of Lemons.
Syrupus Mori	Syrup of Mulberries.
Syrupus Papaveris	Syrup of Poppies.
Syrupus Picis Liquidæ	Syrup of Tar.
Syrupus Pruni Virginianæ	Syrup of Wild Cherry.
Syrupus Rhus	Syrup of Rhubarb.
Syrupus Rhus Aromaticus	Aromatic Syrup of Rhubarb.
Syrupus Rosæ	Syrup of Rose.
Syrupus Rubi	Syrup of Blackberry.
Syrupus Rubi Idæi	Syrup of Raspberry.
Syrupus Sarsaparilla Compositus	Compound Syrup of Sarsaparilla.
Syrupus Scillæ	Syrup of Squill.
Syrupus Scillæ Compositus	Compound Syrup of Squill. ,,
Syrupus Senegæ	Syrup of Senega.
Syrupus Sennæ	Syrup of Senna.
Syrupus Tolutanus	Syrup of Tolu.
Syrupus Zingiberis	Syrup of Ginger.
Tabacum	Tobacco.
Tamarindus	Tamarind.
Tanacetum	Tansy.
Taraxacum	Dandelion.
Terebinthina	Turpentine.
Theobroma Cacao	Chocolate.
Theriaca	Molasses.
Thuja	Arbor Vitæ.
Tinctura Opii	Laudanum.
Tinctura Opii Camphorata	Paregoric.
Tragacantha	Tragacanth.
Triticum	Couch-grass.

LATIN	ENGLISH
Ulmus	Elm.
Ustilago	Corn-smut.
Uva Ursi	Bearberry.
Valeriana	Valerian.
Vanilla	Vanilla.
Veratrina	Veratrine.
Veratrum Viride	American Hellebore.
Viburnum	Black Haw.
Viburnum Opulus	Cramp Bark.
Vinum Album	White Wine.
Vinum Rubrum	Red Wine.
Viola Tricolor	Pansy.
Vitellus	Yolk of Egg.
Xanthoxylum	Prickly Ash.
Zinci Acetas	Acetate of Zinc.
Zinci Chloridum	Chloride of Zinc.
Zinci Iodidum	Iodide of Zinc.
Zinci Oxidum	Oxide of Zinc.
Zinci Sulphas	Sulphate of Zinc.
Zincum	Zinc.
Zingiber	Ginger.

MEDICINES WITH THEIR USES AND DOSES

The various medicines with their individual uses and properties, also their doses, which are approximate, are here given. No definite dosage is applicable to all cases, as some individuals are more readily affected by certain drugs than others; and, moreover, the age of the patient is to be considered.

Ordinarily, the following doses are prescribed for adults; proportionate doses for children are given in the Table of Weights and Measures on pages 551 and 552.

DRUG	PROPERTIES AND USES	DOSE
Acacia, powder	Demulcent; expectorant	30 grains when necessary.
Aconite, tincture	Sedative; narcotic; reduces fever	1 to 5 drops three times a day.
Aloes, powdered	Ecbolic; purgative	3 to 5 grains at night.
Aloes and Myrrh, pills	Ecbolic; stimulant	2 pills three times a day.
Alum, powder	Emetic; astringent	3 to 30 grains twice a day.
Alum, burnt, powder	Escharotic	15 grains, moistened, applied once a day.
Ammonia, Aromatic Spirits	Stimulant	½ teaspoonful every three hours.
Ammonia-water	Caustic; stimulant	10 drops in water three times a day.
Ammonium Benzoate, powder	Antirheumatic	15 grains every three hours.
Ammonium Bromide, powder	Depressant	20 grains three times a day.
Ammonium Carbonate, powder	Stimulant	3 to 5 grains every four hours.
Ammonium Chloride, powder	Expectorant	5 grains every four hours.
Ammonium Iodide, powder	Alterative	4 grain three times a day.
Ammonium Salicylate, powder	Antirheumatic	5 grains every four hours.

DRUG	PROPERTIES AND USES	DOSE
Amyl Nitrite, liquid..	Motor-depressant	3 drops every four hours.
Angelica-root, fluid-extract	Stimulant	1 teaspoonful three times a day.
Aniseed, essence.....	Aromatic; carminative	1 teaspoonful once a day.
Antimony, wine.....	Emetic; expectorant..	15 drops three times a day.
Antipyrine, powder...	Analgesic	3 grains every four hours.
Apocynum, fluid-extract	Expectorant	10 drops every three hours.
Arrowroot, powder....	Tonic; nutritive.....	4 tablespoonfuls twice a day.
Arsenic, Fowler's Solution	Alterative	1 drop three times a day.
Arsenous Acid, powder	Stimulant	1/60 grain three times a day.
Arsenous Iodide, powder	Digestive	1/30 grain three times a day.
Asafetida, powder....	Cathartic; antiseptic..	3 grains every four hours.
Atropina, powder....	Narcotic; anodyne....	1/200 grain three times a day.
Balsam Copaiba, liquid	Diuretic; laxative....	20 drops three times a day.
Balsam Fir, liquid....	Diuretic	10 drops every four hours.
Balsam Peru, liquid...	Stimulant; tonic.....	10 drops three times a day.
Balsam Tolu, tincture.	Antiseptic; expectorant	20 drops every three hours.
Belladonna, tincture..	Narcotic; anodyne....	3 drops three times a day.
Benzoic Acid, powder.	Diuretic	5 grains every three hours.
Berberis, powder.....	Tonic; stimulant.....	25 grains three times a day.
Betanaphthol, powder.	Antiseptic	2 grains every three hours.
Bismuth Ammonium Citrate, powder.....	Astringent	2 grains three times a day.
Bismuth Subcarbonate, powder	Astringent	5 grains every four hours.
Bismuth Subnitrate, powder	Sedative	10 grains three times a day.

DRUG	PROPERTIES AND USES	DOSE
Bittersweet, fluid-extract	Emetic	30 drops three times a day.
Blackberry, cordial	Aromatic; carminative	2 tablespoonfuls every six hours.
Black Cohosh, infusion	Narcotic; diuretic	1 wineglassful three times a day.
Blue Mass, pills	Alterative; cathartic	2 pills at night.
Blue Vitriol, powder	Emetic	1 grain three times a day.
Boneset, infusion	Stimulant	1 tablespoonful three times a day.
Borax, powder	Detergent	15 grains every four hours.
Bromoform, liquid	Sedative	3 drops three times a day.
Bryonia, fluidextract	Irritant	8 drops every six hours.
Buchu, infusion	Diuretic	1 tablespoonful every three hours.
Buckthorn, fluid-extract	Cathartic	1 teaspoonful at night.
Burdock, fluidextract	Herpetic	1 tablespoonful three times a day.
Caffeine, powder	Cerebral stimulant	1 grain every four hours.
Calamus, fluidextract	Aromatic	10 drops after meals.
Calcium Carbonate, powder	Antacid	10 grains three times a day.
Calcium Hypophosphite, powder	Tonic	5 grains every four hours.
Calomel, powder	Cathartic; antiseptic	2 to 5 grains at one dose.
Calumba, decoction	Tonic	1 tablespoonful three times a day.
Calumba, fluidextract	Stomachic	20 grains after meals.
Camphor, powder	Antiseptic; cathartic	2 to 5 grains every three hours.
Camphor, Monobromated, powder	Sedative	1 grain every four hours.
Camphoric Acid, powder	Night-sweats	15 grains at night.
Cannabis Indica, fluid-extract	Narcotic	1 drop three times a day.
Cantharis, tincture	Diuretic; stimulant	3 drops twice a day.
Capsicum, tincture	Carminative	5 drops after meals.

DRUG	PROPERTIES AND USES	DOSE
Caraway-seed, infusion	Aromatic	1 tablespoonful three times a day.
Cardamom, tincture	Stimulant	10 drops after meals.
Cascara Sagrada, fluid-extract	Laxative	1 teaspoonful twice a day.
Castor-oil	Purgative	1 tablespoonful at night.
Catechu, tincture	Astringent	10 drops three times a day.
Catnip, infusion	Stomachic	1 tablespoonful twice a day.
Cayenne Pepper, tincture	Stimulant	5 drops every four hours.
Cerium Oxalate, powder	Sedative	10 grains after meals.
Chalk, prepared, powder	Astringent	10 grains twice a day.
Chalk mixture, powder	Astringent	2 teaspoonfuls every four hours.
Chimaphila, fluid-extract	Diuretic	20 drops three times a day.
Chloralamine, powder	Analgesic	10 grains every four hours.
Chloral Hydrate, powder	Narcotic	5 grains every six hours.
Chloroform, liquid	Anodyne	5 drops three times a day.
Chrysarobin, powder	Alterative	½ grain three times a day.
Cimicifuga, fluid-extract	Sedative	4 drops three times a day.
Cinchona, tincture	Antimalarial	1 teaspoonful every four hours.
Cinnamon, tincture	Aromatic	20 drops after meals.
Citric Acid, crystals	Refrigerant	5 grains every three hours.
Cloves, oil	Stimulant; carminative	3 drops after meals.
Cocaine, powder	Anesthetic	½ grain when necessary.
Cocoa, powder	Tonic	30 grains every three hours.
Codeine, powder	Analgesic	¼ grain when necessary.
Colchicum, fluid-extract	Antirheumatic	1 drop three times a day.

DRUG	PROPERTIES AND USES	DOSE
Colocynthis, extract	Laxative	1 grain three times a day.
Copper Sulphate, powder	Tonic; styptic	2 grains three times a day.
Coriandrum, powder	Adjuvant	4 grains every three hours.
Corn-silk, fluid-extract	Diuretic	30 drops every four hours.
Corrosive Sublimate, powder	Antisyphilitic	1/8 grain three times a day.
Cotton-root, fluid-extract	Abortive	1 teaspoonful every four hours.
Cream of Tartar, powder	Aperient	30 grains every three hours.
Creosote, liquid	Antitubercular	1 drop every four hours.
Creosote-water	Antinausea	1 tablespoonful every two hours.
Cubeba, fluidextract	Sedative	8 drops every three hours.
Cusso, powder	Anthelmintic	2 teaspoonfuls at night.
Cypripedium, powder	Nerve stimulant	1 teaspoonful every six hours.
Dandelion-root, fluid-extract	Laxative	1 teaspoonful twice a day.
Digitalis, tincture	Cardiac tonic	10 drops three times a day.
Dover's Powder	Diaphoretic	5 grains every four hours.
Elaterine, powder	Drastic	1/10 grain every three hours.
Epsom Salts, crystal	Cathartic	1 tablespoonful twice a day.
Eserine Sulphate, powder	Depressant	1/100 grain three times a day.
Ether, liquid	Sedative	15 drops every four hours.
Ethyl Carbamate, powder	Hypnotic	15 grains every six hours.
Eucalyptol, liquid	Expectorant	2 drops every four hours.
Eugenol, liquid	Carminative	3 drops after meals.
Euonymus, powder	Laxative	4 grains every four hours.
Eupatorium, powder	Diaphoretic	20 grains every three hours.

DRUG	PROPERTIES AND USES	DOSE
Fennel-seed, infusion..	Aromatic	1 tablespoonful after meals.
Fever-root, decoction..	Diuretic	1 tablespoonful every four hours.
Flaxseed, infusion....	Demulcent	1 wineglassful every two hours.
Fowler's Solution.....	Alterative	1 drop three times a day.
Frangula, fluidextract.	Laxative	10 drops every four hours.
Gallic Acid, powder...	Astringent	15 grains every four hours.
Gambir	Hemostatic	15 grains every two hours.
Gamboge, powder.....	Cathartic	2 grains every three hours.
Garlic, syrup.....	Expectorant	1 teaspoonful three times a day.
Gaultheria, oil.....	Antirheumatic	2 drops after meals.
Gelsemium, fluid-extract	Cardiac	1 grain every three hours.
Gentian, tincture.....	Bitter tonic.....	1 teaspoonful before meals.
Geranium, fluidextract.	Styptic	15 drops every four hours.
Ginger, tincture.....	Aromatic	15 drops after meals.
Glycyrrhiza, fluid-extract	Expectorant	30 drops three times a day.
Granatum, powder....	Anthelmintic	30 grains at night.
Grindelia, fluid-extract	Expectorant	30 drops every four hours.
Guaiacol, liquid.....	Antipyretic	5 drops every three hours.
Guaiacum, powder....	Alterative	10 grains three times a day.
Guarana, powder.....	Nerve tonic.....	20 grains three times a day.
Hamamelidis, powder.	Astringent	20 grains three times a day.
Hedeoma, powder.....	Stimulant	1 teaspoonful every three hours.
Hematoxylon, powder.	Astringent	10 grains twice a day.
Henbane, tincture.....	Narcotic	10 drops every four hours.

DRUG	PROPERTIES AND USES	DOSE
Hoarhound, syrup	Pectoral	1 tablespoonful every three hours.
Hops, tincture	Nerve tonic	1 teaspoonful every four hours.
Hydrastine, powder	Bitter tonic	1/10 grain three times a day.
Hydriodic Acid, dilute	Alterative	10 drops three times a day.
Hydrobromic Acid, dilute	Sedative	30 drops after meals.
Hydrochloric Acid, dilute	Digestive	10 drops before meals.
Hyoscyamus, tincture	Sedative	30 drops every four hours.
Hypophosphite, syrup	Tonic	1 tablespoonful after meals.
Iodine, crystals	Alterative	1/10 grain three times a day.
Ipecac, syrup	Expectorant	15 drops every two hours.
Iron Chloride, tincture	Tonic	5 drops every four hours.
Iron Hypophosphite	Hematinic	3 grains three times a day.
Iron Quinine Citrate	Antiperiodic	2 grains every four hours.
Iron reduced, powder	Tonic	1 grain every four hours.
Iron Sulphate, powder	Astringent	2 grains every six hours.
Jalap, powder	Hydragogue	15 grains every three hours.
Kino, powder	Astringent	5 grains every four hours.
Krameria, fluid-extract	Hemostatic	15 drops every three hours.
Lactic Acid	Intestinal antiseptic	20 drops after meals.
Lappa, powder	Alterative	20 grains three times a day.
Leptandra, powder	Laxative	10 grains three times a day.
Lithium Benzoate, powder	Antirheumatic	10 grains every four hours.
Lithium Bromide, powder	Nerve sedative	10 grains every three hours.
Lithium Carbonate, powder	Diuretic	5 grains every three hours.
Lithium Citrate, powder	Antirheumatic	7 grains every four hours.

DRUG	PROPERTIES AND USES	DOSE
Lithium Salicylate, powder	Antiarthritic	15 grains three times a day.
Lobelia, tincture	Diuretic	30 drops every four hours.
Lupulinum, powder	Narcotic	5 grains three times a day.
Magnesium, powder	Antacid	30 grains after meals.
Magnesium Carbonate, powder	Laxative	1 teaspoonful twice a day.
Manganese Sulphate, powder	Alterative	4 grains three times a day.
Mastic, gum	Stomachic	20 grains three times a day.
Matico, powder	Aromatic	30 grains after meals.
Mercuric Yellow Iodide, powder	Alterative	1/10 grain three times a day.
Mercury Bichloride	Antiseptic	1/20 grain three times a day.
Mercury with chalk	Intestinal antiseptic	4 grains every four hours.
Morphine, powder	Narcotic	¼ grain when necessary.
Moschus, powder	Stimulant	4 grains three times a day.
Myrrh, gum	Carminative	5 grains every four hours.
Naphthaline, crystals	Antiseptic	1 grain every three hours.
Nitric Acid, dilute	Stimulant	20 drops before meals.
Nux Vomica, tincture	Stomachic	5 drops after meals.
Opium, tincture	Narcotic	10 drops when needed.
Oxgall, purified	Digestive	5 grains after meals.
Pancreatine, powder	Digestive	5 grains before meals.
Paraldehyde, liquid	Hypnotic	30 drops every four hours.
Paregoric, liquid	Sedative	15 drops every four hours.
Pareira, powder	Alterative	20 grains three times a day.
Pelletierine, powder	Teniafuge	2 grains every four hours.
Pepo, emulsion	Teniafuge	1 ounce at night.
Peppermint-water	Carminative	1 ounce after meals.

DRUG	PROPERTIES AND USES	DOSE
Pepsine, powder	Digestive	2 grains every four hours.
Phenacetine, powder	Analgesic	5 grains every six hours.
Phosphoric Acid, dilute	Stomachic	10 drops before each meal.
Phosphorus Elixir	Nerve stimulant	1 teaspoonful three times a day.
Physostigma, powder	Antineuralgic	½ grain three times a day.
Phytolacca, powder	Alterative	8 grains every four hours.
Pilocarpine, powder	Diuretic	1/10 grain every six hours.
Pine Tar, syrup	Expectorant	1 teaspoonful every three hours.
Piperina, powder	Antiperiodic	1 grain three times a day.
Podophyllum, powder	Cholagogue	5 grains at night.
Potassium Acetate, powder	Alterative	15 grains after meals.
Potassium Bicarbonate, powder	Diuretic	20 grains every four hours.
Potassium Bromide, powder	Nerve sedative	10 grains every three hours.
Potassium Chlorate, powder	Astringent	4 grains every four hours.
Potassium Citrate, crystals	Refrigerant	15 grains three times a day.
Potassium Cyanide, crystals	Cough sedative	1/20 grain every three hours.
Potassium Hypophosphite, crystals	Nerve tonic	5 grains after meals.
Potassium Iodide, crystals	Alterative	5 grains three times a day.
Potassium Permanganate, crystals	Deodorant	½ grain every four hours.
Potassium Sulphate, crystals	Cathartic	15 grains every three hours.
Quinine Sulphate, powder	Antiperiodic	4 grains every two hours.
Resorcin, powder	Antiseptic	1 grain every six hours.
Rheum, powder	Cathartic	10 grains three times a day.
Rhus Glabra, powder	Astringent	10 grains every three hours.

DRUG	PROPERTIES AND USES	DOSE
Rubus, powder	Tonic	15 grains after meals.
Rubus Glabra, powder.	Refrigerant	10 grains three times a day.
Sabal, powder	Diuretic	10 grains every three hours.
Salicylic Acid, powder	Antirheumatic	5 grains every four hours.
Salol, powder	Analgesic	5 grains every four hours.
Saltpeter, powder	Antiseptic	7 grains every six hours.
Sanguinaria, powder..	Expectorant	1 grain three times a day.
Santonine, powder	Anthelmintic	1 grain each night.
Sarsaparilla, syrup	Alterative	1 tablespoonful after meals.
Senega, fluidextract..	Expectorant	10 grains three times a day.
Senna, powder	Cathartic	1 teaspoonful at night.
Sodium Benzoate, powder	Antipyretic	10 grains every four hours.
Sodium Bromide, powder	Nerve sedative	15 grains every three hours.
Sodium Citrate, powder	Diuretic	15 grains three times a day.
Sodium Salicylate, powder	Antineuralgic	10 grains every four hours.
Sparteine, powder	Cardiac stimulant	1/5 grain three times a day.
Spigelia, powder	Vermifuge	1 teaspoonful after meals.
Squill, powder	Expectorant	1 grain every four hours.
Stillingia, powder	Alterative	15 grains three times a day.
Stramonium, powder..	Analgesic	1 grain every four hours.
Strontium Bromide, powder	Sedative	10 grains every four hours.
Strontium Iodide, powder	Alterative	5 grains three times a day.
Strontium Salicylate, powder	Antiseptic	15 grains four times a day.
Strychnine, powder	Stimulant	1/60 grain after meals.
Styrax, gum	Alterative	10 grains three times a day.

DRUG	PROPERTIES AND USES	DOSE
Sugar of Lead, powder	Styptic	½ grain every four hours.
Sulphonal, powder	Hypnotic	10 grains at night.
Sulphur, powder	Alterative	½ teaspoonful after meals.
Sulphurated Lime, powder	Antiseptic	½ grain three times a day.
Sulphuric Acid, dilute	Astringent	20 drops after meals.
Sumbul, powder	Nervine	15 grains three times a day.
Tannic Acid, powder	Astringent	5 grains every four hours.
Taraxacum, powder	Laxative	1 teaspoonful three times a day.
Tartaric Acid, powder	Refrigerant	5 grains every three hours.
Terebenum, liquid	Antiseptic	5 drops after meals.
Terpin Hydras, powder	Diaphoretic	1 grain every four hours.
Thymol, crystals	Antipyretic	½ grain every three hours.
Tolu, syrup	Expectorant	1 teaspoonful every two hours.
Uva Ursi, powder	Diuretic	20 grains every four hours.
Valerian, tincture	Nerve sedative	1 teaspoonful every three hours.
Vanilla, tincture	Tonic	½ teaspoonful before meals.
Veratrum, tincture	Cardiac depressant	15 drops every four hours.
Viburnum Opulus, powder	Nerve sedative	20 grains after meals.
Warburg's Tincture	Diaphoretic	1 teaspoonful three times a day.
Wild Cherry, syrup	Cough sedative	1 teaspoonful every three hours.
Yerba Santa, fluid-extract	Expectorant	15 drops three times a day.
Zinc Valerianate, powder	Nervine	3 grains every four hours.

VARIOUS TERMS USED IN THE CLASSIFICATION OF MEDICINES

Adjuvant .....A medicine which assists the action of another.
Alterative .....A medicine altering the processes of nutrition.
Analgesic .....A remedy that relieves pain by depressant action on the nerve centers.
Anesthetic .....Any substance which produces insensibility.
Anodyne .....A medicine that gives relief and produces sleep.
Antacid .....A substance counteracting acidity.
Antarthritic .....A medicine for the relief of gout.
Antipyretic .....An agent reducing the temperature of fever.
Antiseptic .....A remedy having the power to destroy bacteria.
Aperient .....A mild purgative.
Astringent .....An agent producing contraction of organic tissues.
Cardiant .....A remedy that affects the heart.
Carminative .....A soothing medicine, chiefly for children to relieve colicky pains.
Cathartic .....A medicine used to evacuate the bowels.
Caustic .....A substance that destroys living tissue.
Demulcent .....Any substance that protects the mucous membranes.
Deodorant .....A substance that removes offensive odors.
Depressant .....A medicine that retards the action of an organ.
Detergent .....A drug or solution used for cleansing wounds.
Diaphoretic .....A medicine that induces perspiration.
Diuretic .....A medicine that increases the flow of urine.
Ecbolic .....A substance used to produce abortion.
Emetic .....A medicine having the power to produce vomiting.
Emmenagogue ..A medicine that stimulates the menstrual flow.
Escharotic .....A substance that produces a scab on the skin.
Expectorant ....A remedy that promotes expectoration.
Hemagogue .....An agent that promotes the menstrual flow of blood.
Hematinic .....An agent, such as iron, which tends to increase the proportion of coloring-matter in the blood.
Hemostatic .....A remedy that arrests bleeding.
Hydragogue ....A purgative that causes copious liquid discharges.
Hypnotic .....A remedy that causes sleep.
Irritant .....A remedy inducing irritation or inflammation.
Laxative .....A mild purgative; an agent that loosens the bowels.
Narcotic .....A drug which deadens pain.
Pectoral .....A medicine used in diseases of respiratory organs.
Purgative .....A medicine producing copious evacuations.
Refrigerant .....A medicine possessing cooling properties.
Sedative .....An agent that produces a soothing effect.
Stimulant .....An agent exciting the functions of an organ.
Styptic .....A medicine to check hemorrhages.
Tonic .....A medicine which promotes nutrition.
Vesicant .....A medicine causing blisters.

LATIN ABBREVIATIONS WITH THEIR ENGLISH DEFINITIONS

The following Latin abbreviations with their English definitions are here given for the sole purpose of endeavoring to acquaint the layman with the mysteries of the Latin phrases and to enable him to familiarize himself with the various terms usually employed in the writing of prescriptions.

LATIN	ENGLISH
āā	Of each
Acc	Accurately
Ad	To, up to
Adhib	To be administered
Ad. mov	Let there be added
Agit	Shake; stir
Agit. ante sum	Shake before taking
Alt. hor	Every other hour
Amp	Large
Aq. (aqua)	Water
Aq. astr	Frozen water
Aq. bull	Boiling water
Aq. ferv. vel cal	Hot water
Aq. pot	Drinking-water
Bib	Drink
Bis	Twice
Bis in die	Twice a day
Bol	A large pill
Brach	Arm
Bul	Let it boil
C	A gallon
Calom	Mild chloride of merc.
Cap	Let him take
Caput	Of the head
Carbas	Linen, lint
Caute	Cautiously
Cc.	Cubic centimeter (one gram)
Cena	Supper
Chart	Paper
Chin. (cinchona)	Quinine
Cib	Food
Coch. (cochleare)	By teaspoonful
Coch. Amp	Dessertspoonful
Coch. mag	Tablespoonful
Coch. parv	Teaspoonful
Colat	Of the strained liquor
Collum	A nasal wash
Collut	A mouth-wash
Commis	Mix together
Concis	Cut
Cont. rem.	Continue the medicine
Cras	To-morrow
Cuj	Of which; of any
Curs Hod	During the day
Cyath	A wineglassful
D, Dos, Dosis	A dose
Da, Det	Give; let it be given
Dec	Pour off
Decem	The tenth
Decoct	A decoction
Decoq	Boil down
Deglut	To be swallowed
Dieb. alt	Every other day
Dieb. tert	Every third day
Dies vel D	A day
Dil	Dilute; diluted

LATIN	ENGLISH
Div. in p. æq.	Divided in equal parts
Don. alv. dejec.	Until the bowels move
Don. len. dol.	Until the pain is relieved
Dr.	Dram; 60 grains
Dulc, Dulcs.	Sweetness; sweet
Dur. Dolor.	While the pain lasts
Em (emesis)	Vomiting
Et.	And
Ex.	From; out of
Ex paul. aq.	In a very little water
Ext. Extr.	An extract
F. (fac)	Make
F. pil. xij.	Make into twelve pills
Febr.	Fever
Ferv.	Hot
Fluid. vel Fl.	Liquid
Fol. (folia)	Leaves
Ft. (fiat)	Let it be made
Ft. collyr.	Let eye-wash be made
Ft. emuls.	Let emulsion be made
Ft. en.	Let enema be made
Ft. pulv.	Let a powder be made
Ft. ung.	Let ointment be made
Garg.	A gargle
Gm.	A gram
Gr.	A grain
Grum.	A clot
Gtt. (gutta)	A drop; drops
H. (hora)	An hour
Haust.	A draft
Hebdom.	A week
Herb (herba)	A herb
Heri.	Yesterday
Hor. decub.	At bedtime
Hor. j spat.	After one hour
Id. (idem)	The same
Iden.	Often; repeatedly
Infus.	Infusion
Injec.	Injection
In plum.	In gruel
Iter.	Let it be repeated
Jam.	Now
Jentac.	Breakfast
Jul. (julepum)	A julep
Juscel.	A broth
Juscul.	A soup
Lac. (lactis)	Milk; of milk
Lan (lana)	Flannel; wool
Lang.	Languor; lassitude
Larg. (largus)	Abundant; plenty
Larid. (laridum)	Lard
Lat. admov.	Let it be applied to side
Lat. dol.	To the painful side
Lax. (laxus)	Loose; open
Lb. (libra)	A pound
Lect.	A bed
Len.	Easily; gently
Len. ter.	By rubbing gently
Lig.	A ligature
Linim.	A liniment
Lint.	Linen; lint
Lq.	A solution
Lot. (lotio)	A lotion
M., Min.	A minim; a drop
M., Mis., Misce.	Mix
M. (manipulus)	A handful
Mane.	Morning
Manus.	The hand
Mass. (massa)	A mass
Matut.	In the morning
Med. (medius)	Middle
Mens.	By measure
Minut.	A minute
Mis. bene.	Mix well
Mist.	A mixture
Mod. dict.	As to be directed
Modic.	Moderate-sized
Mol. (mollis)	Soft
Mor. sol.	In the usual manner

LATIN	ENGLISH
Natr. (natrium)	Sodium
Nig	Black
Nisi	Unless
No	In number
Noct	Of the night
Noct. maneq	Night and morning
Non	Not
Non repetat	Not repeated
Nunc	Now
O. (octarius)	A pint
Ol. O. Opt	Best olive-oil
Olla	A pot; a jar
Omn. hor	Every hour
Omn. bih	Every two hours
Omn. quadr. hor	Every quarter-hour
Omn. mane	Every morning
Omn. nocte	Every night
Op. (opus)	Need; occasion
Opt	Best
Os (oris)	Mouth
Ov. (ovum)	Egg
P., Pon	By weight
Pab	Food
Pallid	Pale
Pt. æq	Equal parts
Part. vic	In divided doses
Parv	A little
Pastil	A lozenge
Pauc	Little; few
Paŭl	Little by little
Percol	Strain through
Ph	A vial; a bottle
Pil. (pilula)	A pill
Pilus	The hair
Ping. (pinguis)	Fat; grease
Poc. (poculum)	Cup; a little cup
Post cibos	After meals
Postrid	On the next day
Pot (potus)	A drink
Præ, Pre	Before
Prand	Dinner
Primus	The first
Prop	Special; particular
Pro rat. æt.	According to the age of the patient
Prox	Nearest
Pug	A pinch
Pulm	Gruel; pulmentum
Pulv	Powder
Pulv. gros	A coarse powder
Pulv. subtil	A smooth powder
Pulv. ten	A fine powder
Pur. (purus)	Clean; pure
Purg	A purgative
Q. (quadrans)	A fourth part
Qq. (quisque)	Each or every
Qq. hor	Every hour
Q. s	As much as is sufficient
Q. v	As much as you please
Quad	Fourfold
Quam	As much as
Quart. (quartus)	Fourth
Quat. (quater)	Four times
Quinq. (quinque)	Five
Quor. (quorum)	Of which
Quotid	Daily
℞ (recipe)	Take
Rec	Fresh; newly
Renov	Renew; to be renewed
Resid	Residual; remaining
Rum. (rumen)	The throat
S. V. R	Alcohol
S. V. T	Rectified spirits
Sac. lac	Sugar of milk
Sac. sat	Sugar of lead
Sæp	Frequently
Sal	Salt
Sal am. (amarum)	Magnesium sulphate
Sal mir. (mirabile)	Sodium sulphate
Sal vol. (volatile)	Ammonium carbonate
Sap	A flavor; delicacy
Sat	Enough; sufficient
Saturat	Saturated

LATIN	ENGLISH
Scrup.	A scruple; 20 grains
Sed.	The fundament; feces
Semel.	Once
Semidr.	Half a dram
Semih.	Half an hour
Sensim.	Gently; gradually
Separ.	Separately
Septim.	A week
Sesq.	One and a half
Sesqh.	An hour and a half
Sesunc.	An ounce and a half
Sev. (sevum)	Tallow; suet
Si.	If
Sic.	So; thus
Sic.	Dry; dried
Sig. (Signa)	Write
Sign.	Clearly; distinctly
Simul.	Together
Sin.	Without
Sing.	Of each
Sit.	Let it be
Solut.	A solution
Som. (somnus)	Sleep
Spt.	Spirit
Spt. Min. rect.	Rectified spt. of wine
Ss. (semis)	A half
St.	Let it stand
Stat.	Immediately
Stib. (stibium)	Antimony
Stillat.	Drop by drop
Stom.	By stomach
Subind.	Frequently
Suc.	Sap; juice
Sum.	Let him take
Suppos.	Suppository
Syr.	Syrup
T.d., T.i.d.	Three times a day
Tab.	A tablet; lozenge
Teg.	A cover
Temp. (tempus)	Time; temple
Tep. (tepidus)	Tepid; lukewarm
Ter.	Three times
Tere, Teret.	Rub; let it be rubbed
Tert.	Third
Thion. (Thionas)	Sulphur
Tinct., vel Tr.	Tincture
Tinct. herb, rec.	Tincture of fresh herbs
Trit.	Triturate
Troch.	A lozenge
Tus. (tussis)	A cough
Tuto.	Safely
Uln. (ulna)	The arm; elbow
Ult.	At the last
Ult. præsc.	The last ordered
Una.	Together
Unc. (uncia)	An ounce
Unct.	Anointed
Ung.	An ointment
Urg.	Urgent; pressing
Ust.	Burnt
Utdict.	As directed
Vas.	A vessel; bottle
Vas. vit.	A glass vessel
Vel.	Or
Venen.	A poison
Vesp.	In the evening
Vic.	Change
Vin.	Wine
Vir.	Strength; vigor
Virid.	Green
Vol.	Volatile

RHEUMATISM—LUMBAGO—GOUT

RHEUMATISM is a constitutional disease, having for its chief manifestations inflammatory affections of the fibrous textures of joints and other parts, together with a liability to various complications. Two forms of rheumatism are recognized, and will be now briefly described, viz., the acute and the chronic, the latter either resulting from the former or arising independently. In addition to these, a disease which has received the name of rheumatoid arthritis, and which presents many resemblances to chronic rheumatism, although the relation between them is questionable, may be noticed here.

ACUTE RHEUMATISM

Definition.—This form of rheumatism, frequently called rheumatic fever, is mainly characterized by inflammation affecting various joints, with a tendency to spread in an erratic manner, and accompanied by much pain, febrile disturbance and perspiration.

Causes.—The nature of this disease has been extensively discussed by pathologists and physicians; but although numerous, and many of them ingenious, theories have been advanced and supported by evidence drawn from experimentation as well as clinical observation, it cannot yet be said that any one of them has gained general acceptance. It has been held that rheumatism is produced by an excess of lactic acid in the system in connection with morbid states of the nutritive functions. Support to this view was given experimentally by Richardson, but experiments by others have led to a different conclusion. Again, it has been held that the disease is a textural inflammation due to chill acting upon the parts, either locally through the circulation or through the agency of the nervous system, whereby the nutrition of the joints and other structures is lowered. Another view

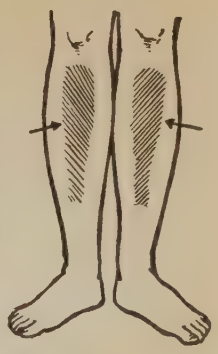
regards it as arising primarily in a profound disturbance of the heat-regulating mechanism of the body by chill.

More recently still, the theory has been put forward that, like other acute diseases, it has a bacterial cause. A certain micrococcus has been obtained both from the inflamed joints and from the blood in cases which showed serious affection of the heart, and many authorities have assigned this as the direct cause of the disease. For several reasons this theory seems highly probable, though it is certain that if the disease be of an organismal nature it must be attributed to more than one organism.

However, waiving the question as to what the direct cause is, and how it acts, there are certain predisposing causes which are generally agreed upon. Thus a hereditary tendency is recognized as among the causes predisposing to acute rheumatism. The extent of this has been variously estimated, but it would appear to be well established that it shows itself in about one-fourth of the cases. Age is another important predisposing condition, the acute form of rheumatism being much more a disease of youth than of later life. The period from sixteen to twenty is that in which probably the greater number of the cases occur; but even in early childhood the disease may manifest itself, or at any period of life, although it is rarely observed in old age. Persons much exposed to all kinds of weather are specially liable to suffer, and hence the disease is more common among the poorer classes. Any depressing cause acting upon the general health, such as overwork or anxiety, or any habitual drain upon the system, such as over-lactation, in like manner has a similar effect. Climate, too, is a factor of great importance, for, although not infrequently met with in temperate or even warm climates, the disease is unquestionably of more common occurrence in cold and damp regions. Attacks of acute rheumatism are brought on in most instances by exposure to cold, by getting wet through, sometimes also by excessive fatigue, such as walking long distances, especially if in addition there have been overheating of the body and subsequent chill. Persons who have once suffered from this disease are very liable to a recurrence on a renewal of the exciting cause, and, even apparently independently of this, from such causes as digestive disturbances.

Symptoms.—An attack of acute rheumatism is usually ushered in by chilliness or rigors, followed with feverishness, and a

feeling of stiffness or pain in one or more joints, generally those of larger or medium size, such as the knees, and sometimes in the lower limbs, as shown in the accompanying figure. It soon becomes intense, and is accompanied by severe constitutional disturbance and prostration. The patient lies helpless in bed, restless, but afraid to move or to be touched, and unable to bear even the weight of the bedclothes. The face is flushed, and the whole body bathed in perspiration, which has a highly acid reaction and a sour, disagreeable odor. The temperature is markedly elevated (103° to 105°), the pulse rapid, full, and soft; the tongue is coated with a yellow fur, and there are thirst, loss of appetite, and constipation. The urine is diminished in quantity, highly acid, and loaded with urates. At first the pain is confined to only one or two joints, but soon others become affected, and there is often a tendency to symmetry in the manner in which they suffer, the inflammation in one joint being shortly followed by that of the same joint in the opposite limb. The affected joints are red, swollen, hot, and excessively tender. The inflammation seldom continues long in one spot, but it may return to those joints formerly affected. In severe cases, scarcely a joint, large or small, escapes, and the pain, restlessness, and fever render the patient's condition extremely miserable.



An attack of acute rheumatism is of variable duration, sometimes passing away in the course of a few days, but more frequently lasting for many weeks. Occasionally, when the disease appears to have subsided, relapses occur which bring back all the former symptoms and prolong the case, it may be for months. Again, after all acute symptoms have disappeared, the joints may remain swollen, stiff, and painful on movement, and the rheumatic condition thus becomes chronic.

After an attack of rheumatism the patient is much reduced in strength and pale-looking for a considerable time, but should no complication have arisen there may be complete recovery, although doubtless there remains a liability to subsequent attacks. This disease derives much of its serious import from certain complications which are apt to attend its progress. Among these may be mentioned excessive fever (hyperpyrexia), which

is sometimes developed in a sudden and alarming manner, the temperature rising rapidly to 108°, 110°, or more, and thus endangering life. Indeed, in most of such instances death speedily follows, unless prompt treatment be resorted to. Delirium often occurs, and St. Vitus's dance sometimes follows acute rheumatism. Besides these, complications connected with the respiratory organs, such as pleurisy, pneumonia, and bronchitis, as well as disorders of the skin, sometimes arise in the course of the disease. But the most frequent and important of all are those affecting the heart, and this organ may even be affected without any of the joints suffering.

Pericarditis (inflammation of the investing membrane of the heart) and endocarditis (inflammation of the lining membrane of the heart) are the two most common forms which these heart complications assume, and it is the latter which is specially important as tending to lay the foundation for valvular heart disease. It is the liability to these inflammatory heart affections that causes special anxiety during the earlier stages of an attack of acute rheumatism, when it would appear they are more apt to occur. The risk of cardiac complications seems to be greater the younger the patient, and doubtless the foundation of organic heart disease is often laid in early childhood, when, as is now well known, rheumatism is by no means uncommon.

The name *subacute rheumatism* is sometimes applied to attacks of the disease of less severe type than that now described, but where yet the symptoms exist in a well marked degree. Cases of this kind may be of even longer duration and more intractable than the more acute variety, although probably the danger to the heart is less.

Treatment.—The patient should be placed in bed between blankets, and should wear a flannel shirt of which the front and arms can be opened to admit of examination of the heart and joints. Movements of all kinds should be, as far as possible, avoided. The diet should consist entirely of milk in the acute stage of the disease, and even when the patient is convalescent meat should be given very sparingly.

The affected joints should be wrapped in absorbent cotton, kept in position by a light bandage or by tapes. If the pain is very great, relief is sometimes obtained by wrapping the painful parts in flannel cloths wrung out of a strong solution of washing

soda. Blisters are sometimes applied over the inflamed joint with benefit, but the treatment is available only when the rheumatism is limited. Relief from very acute pain is obtained in all cases by fixing the joint by means of splints.

Constitutional remedies are of great importance. For a long time the alkalies, and especially the salts of potassium, were the chief remedies resorted to, and for them it was claimed that they shortened the attack, relieved pain, and prevented heart complications. More recently, salicylate of soda, and salol, have been introduced and extensively used, though oil of wintergreen, which contains salicylate of methyl, has long been a household remedy. All these remedies have a remarkable effect in reducing temperature and relieving pain, though it is doubtful whether they do anything to shorten the attack or diminish the risk of heart complications. From twenty to thirty grains of these drugs are given several times in the course of twenty-four hours, but as they are depressing to the heart their action must be carefully watched. In the dangerous complication of hyperpyrexia, the cold bath (in which the water is quickly cooled from 94° to 68° F.) or the cold pack has frequently been successful in lowering temperature and saving life. Tonics, such as iron and quinine, are necessary during convalescence when there are anemia and debility. Persons who have suffered from acute rheumatism should ever afterward be careful to avoid exposure to damp and chill, and to protect the skin by suitable underclothing.

As an external treatment, the following has been highly recommended:

℞ Oil of Wintergreen ..... one ounce
Olive-oil ..... three ounces

Directions: Apply to affected part of body and wrap in flannel.

Taken internally, the following is very beneficial:

℞ Salicylate of Soda ..... two teaspoonfuls
Citrate of Potash ..... two teaspoonfuls
Peppermint-water ..... two ounces

Mix.

Dose: One teaspoonful three times a day.

Or:

℞ Rochelle Salts .....two ounces
Cream of Tartar .....one ounce
Mix.
Dose: Two teaspoonfuls in half a glass of water, three times a day between meals.

Or:

℞ Salicylate of Soda .....four teaspoonfuls
Bicarbonate of Soda .....eight teaspoonfuls
Mix.
Dose: One teaspoonful in half a glass of water, half an hour after meals.

Or:

℞ Aspirin .....five-grain tablets
Dose: One tablet every three hours.

CHRONIC RHEUMATISM

Definition.—Chronic rheumatism appears occasionally to be developed as the result of the acute form, but is more frequently an independent constitutional affection, and is usually a complaint of later life.

Causes.—The causes associated with its occurrence are habitual exposure to cold and damp; hence its frequency among outdoor workers. It is also apt to arise in persons debilitated by overwork or privation. Certain poisons introduced into the system are often attended with symptoms of chronic rheumatism, such as lead, the venereal diseases, etc. This disease is often hereditary. It differs from acute rheumatism in being less frequently attended with fever and constitutional disturbance, and less liable to dangerous complications, but, on the other hand, it is much more apt to produce permanent alterations in the joints and parts affected. In a person who suffers from chronic rheumatism any part that suffers injury, such as a sprained joint, is apt to become the seat of rheumatic pain.

Symptoms.—The joints tend to become swollen both from effusion of fluid and from chronic inflammatory thickening of the textures, and the result is stiffness and sometimes complete immobility. But in addition the sheaths of muscles and of nerves are apt to be affected by chronic rheumatism, causing much suf-

fering. This form of rheumatism is less migratory in its progress than the acute, and tends to remain fixed in a few joints, often in those which are specially exposed to atmospheric influences or to overwork. The chief symptoms are pain and stiffness in movement, more particularly when the efforts begin to be made, becoming less after the limbs and body have been in exercise. Creaking or crackling noises accompany the movements. The pain is apt to be increased during the night, and is besides markedly influenced by the state of the atmosphere, cold and damp aggravating it.

This form of rheumatism, although not directly dangerous to life, tends to lower the health and render the patient more vulnerable to other morbid influences. Besides this, by long continuance it may lead to great deformity and disablement of the frame, in some instances resulting in a condition of utter helplessness.

Treatment.—In chronic rheumatism the remedies are innumerable. This form of the disease is less under the power of medicinal agents than the acute, although much may be done to alleviate the suffering produced by it, as well as to limit its extension. Salicine and the salicylates, so useful in acute rheumatism, are not found as a rule to be of much service, while, on the other hand, alkalies in combination with arsenic, and tonics, such as iron, quinine, cod-liver oil, etc., are very serviceable. Potassium iodide is used to a very large extent in this disease, and compounds containing alkalies, sulphur, and guaiacum. Turpentine in doses of ten drops upon a lump of sugar three times a day, is also recommended, and is very effectual in many cases when continued over some weeks.

Rubbing of the affected parts, either in the form of massage or of friction, with stimulating or soothing liniments, and counter-irritation either with blisters or, still better, with the button cautery, are useful local remedies. The application of an adhesive belladonna plaster of large size often gives relief if the rheumatism is situated in the body. Electricity is often tried in the form of faradism, galvanism, or high-frequency currents. Hot baths, Turkish baths, and especially hot-air or light baths of very high temperature, may often be used with advantage. Recently diathermy (electric thermo-penetration) has been found to give great relief. The mineral waters and baths of various

well known resorts are of undoubted benefit. Changes to warmer climates during the colder season are also beneficial.

One must also remember in the treatment of chronic rheumatism that this ailment may exist as a sequence to other bodily disorders such as constipation, hemorrhoids, or varicose veins, and if these conditions are remedied, the patient may also be relieved of the rheumatism.

℞ Iodide of Potash ..... one teaspoonful
Bicarbonate of Potash ..... one teaspoonful
Tincture of Colchicum ..... two teaspoonfuls
Peppermint-water ..... two ounces
Mix.
Dose: One teaspoonful in a wineglass of water, half an hour after meals.

Or:

℞ Acetate of Potash ..... one teaspoonful
Bicarbonate of Potash ..... two teaspoonfuls
Citrate of Potash ..... two teaspoonfuls
Tincture of Hyoscyamus ..... two teaspoonfuls
Peppermint-water ..... two ounces
Mix.
Dose: One teaspoonful in a small amount of water, every four hours.

For chronic rheumatism, celery is a long-recognized home remedy. It is prepared in the following manner: take a bunch of young celery, chop it up with the leaves, since the leaves contain the greatest medicinal properties, cover with water, and boil slowly for about an hour; strain. When cool, drink one teacupful of this liquid three or four times a day. While taking this celery treatment, it is also advisable to take a dose of Epsom salts every third night.

The above preparation is also very beneficial in cases of nervous troubles.

℞ Oil of Sassafras ..... one-half ounce
Spirits of Camphor ..... one ounce
Turpentine ..... one-teaspoonful
Soap Liniment ..... three ounces
Directions: Apply to the parts night and morning.

RHEUMATOID ARTHRITIS

Definition.—Rheumatoid arthritis, chronic rheumatic arthritis, and arthritis deformans are terms employed to designate a chronic inflammatory affection of joints, involving specially the synovial membranes and articular cartilages, of slow development and progressive character, resulting in stiffening and deformity of the parts.

Causes.—This disease is held by some to partake of the nature of both rheumatism and gout (hence occasionally termed rheumatic gout); others regard it as simply a variety of chronic rheumatism; while, in the opinion of several eminent authorities, it is an independent constitutional affection occurring in persons with a strumous or tubercular tendency. It does not appear to be hereditary. It is more common in women than in men, and occurs at all ages. It is closely connected with conditions of ill health; and hence its frequent occurrence among those whose blood is impoverished by insufficient food, by hardship, or by any drain upon the system. It occasionally follows an attack of acute rheumatism; hence the supposed connection.

Symptoms.—The disease in most cases is slowly developed, and shows itself first by pain and swelling in one joint (knee, wrist, finger, etc.), which soon subside and may remain absent for a considerable time. Sooner or later, however, another attack occurs either in the joint formerly affected or in some other, and it is noticed that the affected articulation does not now regain its normal size but remains somewhat swollen. The attacks recur with increasing frequency, gradually involving more joints, until, in course of time (for its progress is very chronic), scarcely an articulation in the body is free from the disease. Thickening of the textures, with stiffness, is the result, and often considerable deformity from the joints being fixed in certain positions. The muscles of the affected limbs undergo atrophy, and contrast strikingly with the abnormally enlarged joints. Painful inflammatory attacks often occur in the affected joints, and the patient is much reduced in strength by the constant irritation of the disease. In the young the hands are very liable to suffer, and the disease gradually extends and involves other parts; while in old persons it is apt to fasten upon one joint,

often the hip, and is not so apt to spread. The chief changes in the joints are, first, in the synovial membrane, which is at first simply inflamed and contains fluid, but ultimately becomes much thickened; and, second, in the articular cartilage, which tends to split up and become gradually absorbed, leaving the articular ends of the bone exposed. The osseous surfaces thus brought into contact become hard and polished by friction, or, where they are rough toward the edges, they may produce a grating feeling as the person moves. These changes and others affecting the ligaments are apt to produce partial dislocation as well as stiffening of the joint, rendering it deformed and useless. This disease often lasts for many years, sometimes continuing for a lengthened period without much change, but tending gradually to progress and to render the patient more and more helpless. It is not attended with the complications of rheumatism, and is not inconsistent with long life, but its weakening effects upon the system and the ill health with which it is usually associated render the subject of it more liable to the inroads of other diseases.

Treatment.—Rheumatoid arthritis is less amenable to treatment than rheumatism, the remedies for which are not found to be of much value in this disease. Most success is obtained if it is recognized early and measures are taken to strengthen the patient's general health. The best medicinal agents are iron, quinine, cod-liver oil, arsenic. Cod-liver oil, cream, and other soft fats seem to be of especial benefit in this disease, and may be taken in large quantities over a long period. Locally, blisters or milder counter-irritation to the affected joints, galvanism, and injection of fibrolysin are sometimes helpful. Of late, electric and hot-air baths, and more recently diathermy, have been employed in the treatment of this condition, often with a great measure of success.

The following prescription will be found to be valuable:

℞ Fowler's Solution ..... one teaspoonful
Emulsion of Cod-liver Oil ..... six ounces

Mix.

Dose: One tablespoonful half an hour after meals.

Or:

℞ Elixir of Iron, Quinine, and Strychnine ..... four fluid ounces

Dose: One teaspoonful in water before meals.

Diet.—The diet should consist of food poor in nitrogenous material. Red meats should be avoided; also eggs, fried food, fats, and pork. White meats, as fowl, and also fish are allowable. Coffee and tea in diminished quantities. All spiced foods should be avoided. Water in abundance, and organic and fruit acids, such as the juice of lemons, oranges, plums, grapes, etc., are beneficial.

MUSCULAR RHEUMATISM

Definition.—Inflammation of the voluntary muscles, accompanied by pain, stiffness, and soreness of affected muscles, with tenderness and soreness on pressure.

Causes.—Most common in men, following sudden exposure. It may result from a local condition or be a manifestation of a general toxemia; some cases are probably of infectious origin.

Symptoms.—Constant local pain (usually dull) in affected muscle, or pain may be caused by the movement of the affected muscle.

The course of the disease is from a few days to several months, and it often recurs.

Treatment.—Muscular rheumatism runs a slower course than the articular variety, having a strong tendency to become chronic.

Hot applications should be applied by means of flannel, such as:

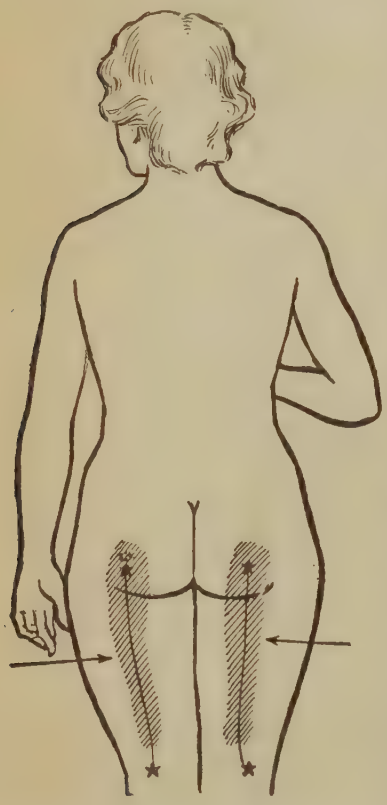
℞ Epsom Salts ..... four teaspoonfuls
Water ..... one teacupful
Mix.
Directions: Keep affected area constantly hot by means of these hot applications, frequently applied.

Doses of Epsom salts should be taken morning and night, with the drinking of a large amount of water during the day. The patient must remain in bed and at rest, both mentally and physically.

SCIATICA

Definition.—This may be either a neuralgia or a neuritis affecting the large sciatic nerve running down the back of the thigh. It is very common in men, especially over the age of thirty, and more particularly in persons with gouty or rheumatic tendencies.

Causes.—It may come on from exposure to cold or damp, and also from injury, such as prolonged pressure from a badly fitting bicycle saddle, or even from sitting on hard benches, and sometimes it is due to the pressure of growths about the hip-bone or within the pelvis, or to some other diseased condition around the hip-joint. In persons with sciatica on both sides, the possibility of its being due to diabetes must be kept in mind, while another error sometimes made is to mistake the shooting pains of early locomotor ataxia for sciatica.



Symptoms.—The chief symptom is pain along the line of the nerve at the back of the thigh, as shown by the shaded area in the accompanying illustration, particularly when the leg is in any position which puts a strain on the nerve. Thus it may be painful when sitting, or when the leg is forcibly bent at the hip-joint with the knee kept straight. The pain is, as a rule, only absent when the person is lying down. There are often points tender to pressure at the back of the hip, behind the knee, behind the prominence of bone on the outer side of the leg just below the knee-joint, and also at the outer side of the ankle behind the prominence of bone there. The pain may be continuous, or it may come in paroxysms. Cramp and tingling feeling are experienced at the back of the thigh. In obstinate, long-standing cases the muscles of the leg may waste considerably. Sciatica, as a rule, can be cured fairly easily, but recurrences are common, and in severe cases it may take months to effect a cure.

Treatment.—Where there is any definite diseased condition, such as diabetes, or any tumor pressing on the nerve, the treatment must naturally be directed toward the removal of this. In cases where gout or rheumatism is present, the patient ought to

receive special remedies appropriate to those conditions—either colchicum or salicylates. Local treatment, however, is practically always necessary. If the case is at all severe, the patient must be kept in bed, and the leg given as complete rest as possible, and it may be necessary to apply a long splint right from the armpit to the heel to secure this. The limb should be kept warm by wrapping it in absorbent cotton and by lying on hot-water bags, the knee being kept slightly more elevated than the rest of the limb by means of a cushion. Blisters are frequently applied along the line of the nerve at the back of the thigh. In severe cases more vigorous measures may have to be used, and probably the best of those is to have a number of needles inserted into the course of the sciatic nerve, this being done, of course, under strictly antiseptic precautions. In other cases, injections of various substances into the nerve are employed, chiefly with the object of breaking down the adhesions which form around it as a result of the chronic inflammatory condition which constitutes neuritis. In milder cases electricity and baths of various kinds, especially peat baths, will often give excellent results. Massage is also of use at times, but should not be employed during the acuter stages, when there is much pain. In a very few extremely bad cases operation may be necessary, either to stretch the nerve or actually to remove a portion of it, where the pain is unbearable and it has resisted all other methods of treatment.

The following prescriptions will be found very beneficial:

℞ Sodium Salicylate .....five-grain tablets
Dose: One tablet every two hours until relieved.

Or:

℞ Wine of Colchicum .....one-half ounce
Elixir Simplex .....three ounces
Dose: One teaspoonful three times a day, after meals.

Or:

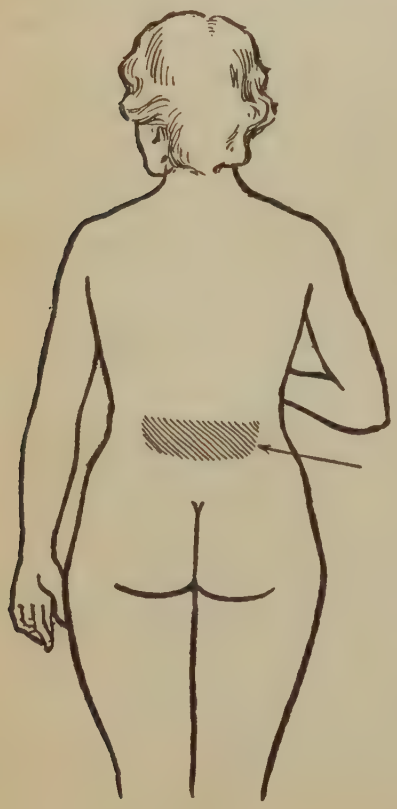
℞ Oil of Wintergreen .....two ounces
Directions: Rub a small amount on the painful area, night and morning.

LUMBAGO

Definition.—Lumbago is a term applied to a painful ailment affecting the muscles of the lower part of the back, generally regarded as of rheumatic origin.

Cause.—Lumbago seems to be brought on by exposure to cold and damp, and by the other exciting causes of rheumatism. Sometimes it follows a strain of the muscles of the loins. The pain accompanying rheumatic manifestations in this region is believed to be due to an inflammatory condition in the connective tissues of the muscles, causing congestion of the blood-vessels and consequent pressure upon the endings of the sensory nerves.

Symptoms.—An attack of lumbago may occur alone, or be associated with rheumatism in other parts of the body at the time. It usually comes on as a seizure, often sudden, of pain in one or both sides of the small of the back, of a severe cutting or stabbing character, greatly aggravated on movement of the body, especially in attempting to rise from the recumbent posture, and also in the acts of drawing a deep breath, coughing, or sneezing. So intense is the suffering that it is apt to suggest the existence of inflammation in some of the neighboring internal organs, such as the kidneys, bowels, etc., but the absence of the symptoms specially characteristic of these latter complaints, or of any great constitutional disturbance beyond the pain, renders the diagnosis a matter of no great difficulty. The attack is in general of short duration, but occasionally it continues for quite a long time, not in such an acute form as at first, but rather as a feeling of soreness and stiffness on movement.



Treatment.—The treatment includes that for rheumatic affections in general, and the application of local remedies of counter-irritant nature. Of these the best are hot fomentations with turpentine or laudanum applied by means of flannel over the part affected, as shown by the shaded area in the figure on opposite page, or the rubbing in, if this can be borne, of stimulating liniments, such as those of belladonna, chloroform, aconite, etc. The old and homely plan of counter-irritation by applying a heated iron to the part with a sheet of brown paper interposed is often beneficial in chronic cases. Of late, the hot-air bath, and various electrical applications, including faradization, static breeze, and high frequency currents, have been used with at least temporary alleviation of the pain.

As an external treatment, the following has been recommended:

℞ Oil of Wintergreen ..... one ounce
Olive-oil ..... three ounces

Directions: Apply to affected part of body and wrap in flannel.

Taken internally, the following is beneficial:

℞ Salicylate of Soda ..... two teaspoonfuls
Citrate of Potash ..... two teaspoonfuls
Peppermint-water ..... two ounces

Mix.

Dose: One teaspoonful three times a day.

Or:

℞ Rochelle Salts ..... two ounces
Cream of Tartar ..... one ounce

Mix.

Dose: Two teaspoonfuls in half a glass of water, three times a day between meals.

Or:

℞ Salicylate of Soda ..... four teaspoonfuls
Bicarbonate of Soda ..... eight teaspoonfuls

Mix.

Dose: One teaspoonful in half a glass of water, half an hour after meals.

Or:

℞ Aspirin ..... five-grain tablets

Dose: One tablet every three hours.

TORTICOLLIS—WRYNECK

Definition.—Rheumatism of the muscles of the neck, occurring principally on the sides.

Causes.—Exposure to sudden changes of temperature and weather conditions.

Symptoms.—Similar to lumbago. The pain is dull and aching and often paroxysmal, involving a nerve.

Treatment.—The general treatment of hot applications of flannel cloths saturated with Epsom salts or turpentine usually relieves the pain. The application of capsicum vaseline is also very good, and should be used in conjunction with the hot applications.

PLEURODYNIA

Pleurodynia means a painful condition of the chest wall. It may be due to rheumatism of the intercostal muscles or to neuralgia of the intercostal nerves; or, when of a sharp nature, popularly known as a "stitch in the side," to cramp.

℞ Aspirin .....five-grain tablets
Dose: One tablet every two hours until relief is obtained.

Strap the side. Use hot packs. Rub with oil of wintergreen, and bandage.

GOUT

Definition.—Gout is a constitutional disorder connected with excess of uric acid in the blood, and manifesting itself by inflammation of joints, with deposition therein of urate of soda, and also by morbid changes in various important organs.

The term gout, which was first used about the end of the thirteenth century, is derived through the French *goutte* from the Latin *gutta,* a drop, in allusion to the old pathological doctrine (which in the present case seems to be essentially the correct one) of the dropping of a morbid material from the blood within the joints.

In all times this disease has engaged a large share of the at-

tention of physicians, from its wide prevalence and from the amount of suffering which it entails.

Causes.—Most authorities agree in connecting gout closely with an altered state of the blood, more particularly with the presence in that fluid of an excessive amount of uric acid, and its subsequent deposition in the joints in the form of urate of soda and lime. Uric acid is formed in the system in the processes of nutrition, and is excreted by the kidneys, the amount passing off in the urine being estimated at about eight grains daily. In the healthy human subject the blood contains at most a mere trace of this acid; but in gout it may be detected in abundance in the blood-serum, both prior to and during the acute attack, while in chronic gout it becomes a constant constituent of the blood and of other fluids of the body, both natural and morbid. It is not merely the presence of the uric acid in the blood, but its deposition in the inflamed part, that gives rise to the attack of gout, the inflammation being the effect and not the cause of the deposit. The gouty paroxysm thus induced appears to rid the system to a certain extent of the accumulated uric acid, although such relief is generally of but temporary duration.

Whether the accumulation of urates in the blood be due, as some affirm, to their excessive formation in the system as the result of functional derangement of the liver, or, as others hold, depends simply on the diminished excretion by the kidneys of the daily amount, is disputed, although it has been often observed during an attack of gout that the amount of uric acid excreted was markedly deficient. The likelihood is that both these conditions concur, and that while the kidneys retain their functional integrity, even an excessive amount of uric acid in the system may be got rid of, but that these organs, becoming themselves affected by the deposition of urates in their tubular structure, lose to a large extent their excreting power, and thus the blood is overcharged with the product which the kidneys can no longer entirely remove. In the gouty state, either on account of defective action of the kidneys, or from excessive introduction of urates into the circulation, the urates accumulate and, gradually uniting with the sodium carbonate of the blood, are transformed into the much less soluble biurate, which accordingly is deposited in the tissues. This can be prevented by the presence of potassium or lithium salts in the blood, the biurate of these

metals being much more soluble, and salts of these metals are accordingly much used as remedies.

Whatever theories be held as to the immediate cause of gout, it is evident that there is some habit, diathesis, or predisposition of certain individuals. It is beyond dispute that gout is in a marked degree hereditary, fully more than half the number of cases being of this character; but it is no less certain that there are habits and modes of life the observance of which may induce the disease even where no hereditary tendencies can be traced, and the avoidance of which may, on the other hand, go far toward weakening or neutralizing the influence of inherited liability. Gout is said to affect the sedentary more readily than the active, but this cannot be taken as a very constant rule. If, however, inadequate exercise be combined with a luxurious manner of living, with habitual overindulgence in animal food and rich dishes, and especially in alcoholic beverages, then undoubtedly the chief factors in the production of the disease are present.

It is generally stated that fermented are more injurious than distilled liquors, and that, in particular, the stronger wines, such as port, sherry, and Madeira, are much more potent in their gout-producing action than the lighter class of wines, such as hock, Moselle, etc., while malt liquors are fully as hurtful as strong wines. It seems quite probable that overindulgence in any form of alcohol, when associated with the other conditions already adverted to, will have very much the same effect in developing gout. Those who affirm the mischievous effects of fermented liquors in this way are obliged to admit that they are injurious in proportion to the amount of alcohol they contain. The comparative absence of gout in countries where spirituous liquors are chiefly used, such as Scotland, is cited as showing their relatively slight effect in encouraging that disease. Gout is not a common disease among the poor and laboring classes, and when it does occur, may often be connected even in them with errors in living. It is not very rare to meet gout in butlers, coachmen, etc., who are apt to live luxuriously while leading comparatively easy lives.

Gout, it must ever be borne in mind, may also affect persons who observe the strictest temperance in living, and whose only excesses are in the direction of overwork, either physical or intellectual. The influence of hereditary tendency may often be

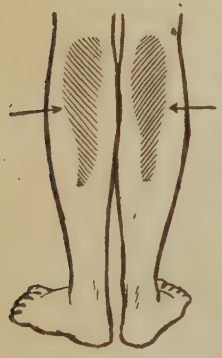
traced in such instances, and is doubtless called into activity by the depressing consequences of overwork. It may, notwithstanding, be affirmed as generally true that those who lead regular lives and are moderate in the use of animal food and alcoholic drinks, or, still better, abstain from the latter altogether, are little likely to be the victims of gout even where an undoubted inherited tendency exists.

Gout is more common in mature age than in the earlier years of life, the greatest number of cases in one decennial period being between the ages of thirty and forty, next between twenty and thirty, and thirdly between forty and fifty. It may occasionally affect very young persons, but such cases are generally in a marked degree hereditary. Women are much less the subjects of gout than men, apparently from their less exposure to the influences (excepting of course that of heredity) which tend to develop the disease, and doubtless also from the differing circumstances of their physical constitution. It most frequently appears in females after the cessation of the menses. Persons exposed to the influence of lead-poisoning, such as plumbers, painters, etc., are apt to suffer from gout.

Attacks of gout are readily excited in those predisposed to the disease. Exposure to cold, disorders of digestion, fatigue, and irritation or injuries of particular joints will often precipitate the gouty paroxysm.

Symptoms.—The premonitory symptoms, especially in those who have previously suffered from the disease, may be sufficiently precise to indicate the impending seizure. Among the more common of these may be mentioned marked disorders of the digestive organs, with a feeble and capricious appetite, flatulence and pain after eating, and uneasiness in the right side in the region of the liver. A remarkable tendency to gnashing of the teeth is sometimes observed. These symptoms may persist for many days, and then undergo amelioration immediately before the paroxysm. On the night of the attack, the patient retires to rest apparently quite well, but about two or three o'clock in the morning is awakened by a painful feeling in the foot, most commonly in the ball of the great toe, but it may be in the instep or heel, or in the thumb. With the pain there often occurs a distinct shivering, followed by feverishness. The pain soon becomes of an agonizing character. Now it is a violent stretching

and tearing of the ligaments, now it is a gnawing pain, and now a pressure and tightening; so exquisite and lively meanwhile is the part affected that it cannot bear the weight of the bedclothes, nor the jar of a person walking in the room. The affected part is swollen and of a deep-red hue. The skin is tense and glistening, and the surrounding veins are more or less distended. After a few hours there is a remission of the pain, slight perspiration takes place, and the patient may fall asleep. The pain may continue moderate during the day but returns as night advances, and the patient goes through a similar experience of suffering to that of the previous night, followed by a like abatement toward morning. These nocturnal attacks occur with greater or less severity during a week or ten days. As the symptoms decline, the swelling and tenderness of the affected joint abate, but the skin over it pits on pressure for a time. During the attacks the patient is restless and extremely irritable, suffers from cramp in the limbs, generally around the parts as shown by the shaded area in the accompanying figure, and from dyspepsia, thirst, and constipation. The urine is scanty and high-colored, with a copious deposit, consisting chiefly of urates. During the continuance of the symptoms the inflammation may leave the one foot and affect the other, or both may suffer at the same time. After the attack is over, the patient feels quite well, and fancies himself better than he has been for a long time before. It is rare that the first is the only attack of gout, and another is apt to occur within a year, although by care and treatment it may be warded off.



In the earlier recurrence the same joints as were formerly the seat of the gouty inflammation suffer again, but in course of time others become implicated, until in advanced cases scarcely any articulation escapes, and the disease thus becomes chronic. It is to be noticed that when gout assumes this form the frequently recurring attacks are usually attended with less pain than the earlier ones, but their disastrous effects are evidenced alike by the disturbance of various important organs, especially the stomach, liver, kidneys, and heart, and by the remarkable changes which take place in the joints from the formation of the so-called

chalk-stones or tophi. These deposits, which are highly characteristic of gout, appear at first to take place in the form of a semifluid material, consisting for the most part of biurate of soda, which gradually becomes more dense, and ultimately quite hard. When any quantity of this is deposited in the structures of a joint the effect is to produce stiffening, and, as deposits appear to take place to a greater or less amount in connection with every attack, permanent thickening and deformity of the parts is apt to be the consequence. The extent of this depends of course on the amount of the deposits, which, however, would seem to be in no necessary relation to the severity of the attack, being in some cases even of chronic gout so slight as to be barely appreciable externally, but on the other hand occasionally causing great enlargement of the joints, and fixing them in a flexed or extended position which renders them entirely useless. Any of the joints may be thus affected, but most commonly those of the hands and feet. The deposits take place in other structures besides those of joints, such as along the course of tendons, underneath the skin and on the bone, and especially on the cartilages of the external ear. When biurate of soda is largely deposited in joints the skin sometimes gives way and the concretion is exposed.

The recognition of what is termed irregular gout is less easy than that form above described, where the disease gives abundant external evidence of its presence; but that other parts than joints suffer from gouty attacks is beyond question. The diagnosis may often be made in cases where in an attack of ordinary gout the disease suddenly leaves the affected joints and some new series of symptoms arises. It has been often observed, when cold has been applied to an inflamed joint, that the pain and inflammation in the part ceased, but that some sudden and alarming seizure referable to the stomach, brain, heart, or lungs supervened. Such attacks, which correspond to what is termed retrocedent gout, often terminate favorably, more especially if the disease again returns to the joints. Gout, when of long standing, is often found associated with degenerative changes in the heart and large arteries, the liver, and especially the kidneys, which are apt to assume one of the forms of Bright's disease.

Treatment.—The usual treatment is as follows: during the acute attack the affected part should be kept at perfect rest, and

have applied to it warm fomentations or poultices, also be wrapped in cotton saturated with a hot solution of Epsom salts, and covered with oil silk.

The use of some laxative such as calomel (three to five grains), followed by a saline purge, is of service, as well as the free administration of bicarbonate or acetate of potash.

℞ Potassium Bicarbonate .....fifteen-grain powders
Dose: One powder every three hours, followed by water.

The medicinal agent upon which most reliance is placed is colchicum. This drug is so efficient that we may safely assert that colchicum possesses as specific a control over the gouty inflammation as cinchona barks or their alkaloids over intermittent fever. The mode of action of colchicum is uncertain, but it is probable that it has simply a special sedative action upon the gouty inflammation, without affecting the excretion of uric acid. It is usually administered as follows:

℞ Wine of Colchicum-seed .....two fluid ounces
Dose: Twenty drops in water every four hours.

Or:

℞ Extract of Colchicum-seed .....half-grain pills
Dose: One pill every three hours.

The effect of colchicum in subduing the pain is generally so prompt and marked that it is unnecessary to have recourse to opiates; but well known nauseating and depressing consequences, should they appear, render the suspension of the drug necessary. Otherwise the remedy may be continued in gradually diminishing doses for some days after the disappearance of the gouty inflammation. Should gout give evidence of its presence in an irregular form by attacking internal organs, besides the medicinal treatment above mentioned, the use of frictions and mustard applications to the joints is indicated with the view of exciting its appearance there.

When gout has become chronic, colchicum, although of less service than in acute gout, is yet valuable, particularly when the acute attacks recur. More benefit, however, appears to be derived from iodide of potassium, guaiacum, and more especially

from the alkalies potash and lithia. The latter is generally taken in this form:

℞ Potassium Iodide .....one teaspoonful
Lithium Iodide .....one teaspoonful
Water .....four fluid ounces
Mix.
Dose: One teaspoonful in a glass of water every three hours.

℞ Saleratus .....one tablespoonful
Saltpeter .....one tablespoonful
Water .....one tumblerful
Mix.
Dose: One tablespoonful three times a day.

The effect upon the gouty constitution of certain mineral waters and baths is well known, the alkaline waters being the favorite. The particular resort must in each case be determined by the physician, and special caution must be observed in recommending this plan of treatment for persons whose gout is complicated by organic disease of any kind.

The diet and regimen to be employed in the intervals of the gouty attacks are of the highest importance. Restriction must be laid upon the amount and quality of the food, and still more upon the alcoholic stimulants. By those more advanced in life who, from long-continued habit, are unable entirely to relinquish the use of stimulants, the strictest possible temperance must be observed. Regular but moderate exercise in the form of walking or riding, in the case of those who lead sedentary lives, is of great advantage, and all overwork, either physical or mental, should be avoided.

Dr. Hare of Philadelphia says: "For hospital practice a very useful mixture is made by adding one part of bicarbonate of soda to nine parts of linseed oil. The joint is then wrapped in a piece of lint soaked with this concoction. In some cases oil of peppermint has been recommended."

Prevention.—Live temperately, abstain from alcohol, eat moderately, have plenty of fresh air and sunshine, plenty of exercise, and regular hours. The skin should be kept active, if the patient is robust, by the morning cold bath with friction after it; but if

he is weak and debilitated, the evening warm bath should be substituted. The patient should dress warmly, avoid rapid alternations in temperature, and be careful not to have the skin suddenly chilled.

Diet.—The diet should consist of food poor in nitrogenous material. Red meats should be avoided; also eggs, fried foods, fats, and pork. White meats, as fowl, and also fish are allowable. Coffee and tea in diminished quantities. All spiced foods should be avoided. Water in abundance, and organic and fruit acids, such as the juice of lemons, oranges, plums, grapes, etc., are beneficial.

NERVOUS DISEASES

INTRODUCTION

THIS class of diseases is undoubtedly the most difficult of diagnosis, and frequently the most unpromising, as regards treatment, of all bodily affections. The brain and spinal cord being inclosed in the skull and spine, beyond the reach of direct examination, and the nerves being almost everywhere deeply buried in the tissues, the nature of nervous diseases must be made out from the disturbances of organs governed by the affected nerves.

Many factors contribute to the production of nervous diseases. That certain diseases are induced by a particular temperament, or by peculiar habits of life, is proved by the fact that some of the diseases are commoner among one race, others in another people. Heredity is in several ways an important matter. Some persons, particularly those of great intellectual power and of artistic temperament, seem born with a nervous constitution, which renders them more than ordinarily liable to the slighter nervous affections, such as headaches, neuralgia, hysterical manifestations, and bizarre forms of mental activity. Those also who come of a degenerate stock seem to suffer very readily from nervous diseases of a severe type, probably not because these diseases are inherited, but because the nervous system is specially exposed to strain by the conditions of modern life, and in such persons gives way early.

There are two great symptoms of nervous disease, viz.: disturbances of sensation in the direction either of loss of feeling, or of great pain, or of perverted sensation, such as tingling, hot flushes, etc.; and the occurrence of more or less complete paralysis of groups of muscles, or of whole limbs. One or other of these types of symptoms predominates, according as sensory or motor nerves are chiefly affected. In addition to these, there is in dif-

ferent diseases more or less interference with the organs of special sense, the reflex actions, the nutrition of outlying parts of the body, and the functions of internal organs.

With regard to *sensory symptoms,* loss of the sense of touch is found in locomotor ataxia, angular curvature of the spine, and generally speaking, all maladies in which the posterior part of the cord or sensory nerves are affected. Syringomyelia is a disease affecting the central portion of the spinal cord, and characterized by loss of the power to feel pain and to recognize heat and cold in parts of the lower limbs. Painful sensations are present in many diseases, as, for example, shooting pains in locomotor ataxia, and the feeling of a tight band round the waist in this disease.

As to *motor symptoms,* wasting of muscles and loss of power in parts of the body point usually to some affection of the motor nerves. Spasm as well as loss of power accompanies affections situated in the higher motor tracts of the brain and spinal cord, while flaccid palsy characterizes diseases and injuries in the gray matter of the cord or in the motor nerves. Conditions in which the nervous system is merely temporarily weakened are manifested by loss of tone in the muscular system, and speedy exhaustion on exertion. Twitchings in the muscular fibers, as in the condition popularly known as "live flesh" in the eyelids, are also found in this passing condition, as well as in more serious conditions, such as at the onset of progressive muscular atrophy. The impairment of the power of combination among muscles, known as incoördination, which produces trembling on exertion, staggering gait, difficulty in buttoning the clothes or in taking food, etc., is found in disseminated sclerosis, St. Vitus's dance and trembling palsy.

The *reflex functions,* tested by stroking the skin of various parts and observing the resulting muscular contraction beneath (superficial reflexes), and by tapping the tendons of muscles and watching the twitch that the latter give (deep reflexes), are, generally speaking, diminished when the sensory nerves or sensory paths in the spinal cord are affected. They are increased when the higher motor paths in the cord are affected, as in disseminated sclerosis, and in some diseases, like hysteria, associated with defective nerve control.

Nutritional functions are impaired in all serious nerve diseases

and injuries. As a result, localized sweatings, a glassy condition of the skin, bed-sores, ulcers, and even gangrene of limbs are liable to appear in the final stages of nervous maladies.

The *functions of the internal organs,* being, as a rule, governed by the sympathetic system, are not in general affected unless this system be diseased. The movement of the bowel and bladder is, however, governed by spinal nerves, and thus these natural functions are impaired in all serious diseases of the spinal cord, so that difficulty of voiding or of retaining the stools and urine appears in such cases.

When the *cranial nerves* proceeding from the brain are involved, very definite symptoms arise. Thus affection of the first nerve gives rise to loss of smell; of the second nerve to blindness; of the third, fourth, and sixth nerves to squints; of the fifth nerve to neuralgia; of the seventh nerve to paralysis; of the eighth nerve to deafness; of the ninth nerve to loss of taste; of the tenth nerve to affections of the larynx, the heart, and the stomach; of the eleventh nerve to disordered action of the sterno-mastoid muscle, causing wryneck; and of the twelfth nerve to interference with the movements of the tongue, and consequent difficulty in pronunciation. Rest, which gives an opportunity for repair to the worn-out tissues, is the great remedy in all types of disease due to overstrain of body or mind, shock, or inflammatory processes. Rest in its widest sense includes not merely cessation of activity, but suitable food, change of employment, and, it may be, active exercise in persons who have usually much mental work.

EPILEPSY—FALLING SICKNESS

Definition.—Epilepsy is a term which, as generally understood, is applied to a nervous disorder characterized by a fit of sudden loss of consciousness, attended with convulsions.

Causes.—Epilepsy has ever been regarded as one of the most formidable diseases that can afflict mankind, and much labor has been bestowed upon the investigation of its pathology. It must, however, be confessed that morbid anatomy has hitherto failed to throw any satisfactory light upon the real nature of this disease. Many cases are due to some organic disease of the brain, such as a tumor, inflammation of the membranes of the

brain, or the scar of some old injury, but this certainly does not occur in half the cases of epilepsy met with.

Practically all that can be said about the direct cause is that, in the healthy brain, nerve energy is capable, under control of the will, of being expended in a sudden and explosive but regulated manner, while, in the disease known as epilepsy, uncontrolled discharges of energy, devoid of any purposive action, take place from time to time in an unusual manner.

Various predisposing factors must, however, be taken into account. The influence of hereditary predisposition in epilepsy is very marked. Where epilepsy is hereditary, it generally manifests itself at an unusually early period of life. In connection with the hereditary transmission of epilepsy, it must be observed that all authorities concur in the opinion that this disease is one of the baneful effects that often follow marriages of near relatives. Further, there is reason to believe that intemperance, apart altogether from its direct effect in favoring the occurrence of epilepsy, has an evil influence in the hereditary transmission of this as of other nervous diseases.

Among other causes which are influential in the development of epilepsy may be mentioned sudden fright, prolonged mental anxiety, overwork, and debauchery. Epileptic fits also occur in connection with injuries of the head and organic disease of the brain, as well as with a depraved state of the general health, and with irritations in distant organs, as seen in the fits occurring in dentition, in kidney disease, and as the result of worms in the intestines.

Symptoms.—Although in most instances an epileptic attack comes on suddenly, it is in certain cases preceded by certain premonitory indications or warnings, which may be present for a greater or less time previously. These are of very varied character, and may be in the form of some temporary change in the disposition, such as unusual elevation or depression of spirits, or of some alteration in the looks. Besides these general symptoms, there are frequently peculiar sensations which immediately precede the onset of the fit, and to such the name of *aura epileptica* is applied. In its strict sense, this term refers to a feeling of a breath of air blowing upon some part of the body and passing upward toward the head. This sensation, however, is not a common one, and the term has now come to be ap-

plied to any peculiar feeling which the patient experiences as a precursor of the attack. The so-called "aura" may be of mental character, in the form of an agonizing feeling of momentary duration; of sensory character, in the form of pain in a limb or in some internal organ, such as the stomach; or unusual feeling connected with the special senses, such as a strange smell or extraordinary vision; or, further, of a motor character, in the form of contractions or trembling in some of the muscles. When such sensations affect a limb, the employment of firm compression by the hand or by a ligature may succeed in warding off an attack. The aura may be so distinct and of such duration as to enable the patient to lie down or seek a place of safety before the attack comes on.

The seizure is usually preceded by a loud scream or cry, which is not to be ascribed, as was at one time supposed, to terror or pain, but is due to the convulsive action of the muscles of the larynx, and the expulsion of air through the narrowed glottis. If the patient is standing he immediately falls, and often sustains serious injury. Unconsciousness is complete, and the muscles generally are in a state of stiffness or tonic contraction, which may be found to affect those on one side of the body in particular. The head is turned toward one or other shoulder, the breathing is for the moment arrested, the countenance first pale, then livid, the pupils dilated, and the pulse rapid. This, the first stage of the fit, generally lasts for about half a minute, and is followed by the state of clonic (tumultuous) spasm of the muscles, in which the whole body is thrown into violent agitation, occasionally so great that the bones may be fractured or dislocated. The eyes roll wildly, the teeth are gnashed together, and the tongue and cheeks are often severely bitten. The breathing is noisy and laborious, and foam (often tinged with blood) issues from the mouth, while even the contents of the bowels and bladder may be ejected. The aspect of the patient in this condition is shocking to witness, and the sight has been known to induce a similar attack in an onlooker. This stage lasts for a period varying from a few seconds to several minutes, when the convulsive movements gradually subside, and relaxation of the muscles takes place, together with partial return of consciousness, the patient looking confusedly about him and attempting to speak. This, however, is soon followed by drowsiness and stupor, which may

continue for several hours, when he awakes either apparently quite recovered, or fatigued and depressed, and occasionally in a state of excitement which sometimes assumes the form of mania.

The other manifestation of epilepsy, to which the names *epilepsia mitior* or *le petit mal* are given, differs from that above described in the absence of the convulsive spasms. It is also termed by some authors *epileptic vertigo* (giddiness), and consists essentially in the sudden arrest of volition and consciousness, which is of but short duration, and may be accompanied with staggering or some alteration in position or motion, or may simply exhibit itself in a look of absence or confusion, and should the patient happen to be engaged in conversation, by an abrupt termination of the act. In general it lasts but a few seconds, and the individual resumes his occupation without perhaps being aware of anything having been the matter. In some instances there is a degree of spasmodic action in certain muscles which may cause the patient to make some unexpected movement, such as turning half round, or walking abruptly aside, or may show itself by some unusual expression of countenance, such as squinting or grinning. There may be some amount of "aura" preceding such attacks, and also of faintness following them. The *petit mal* most commonly coexists with the *grand mal,* but has no necessary connection with it, as each may exist alone.

Treatment.—During the fit little can be done beyond preventing the patient as far as possible from injuring himself while unconsciousness continues. Tight clothing should be loosened, and a cork or pad inserted between the teeth. When the fit is of long continuance, the dashing of cold water on the face and chest may be useful; in general, however, the fit terminates independently of any such measures. When the fit is over, the patient should be allowed to sleep, and have the head and shoulders well raised.

In the intervals of the attacks the general health of the patient is one of the most important points to be attended to. The strictest hygienic rules should be observed, and all the causes which have been mentioned as favoring the development of the disease should as far as possible be avoided. Of medicinal remedies for epilepsy there are innumerable varieties, but only a few deserve mention as possessing any efficacy in controlling or curing the

disease. For no disease has a greater number of specifics been vaunted and found to be useless. The metallic salts, especially those of zinc, silver, and arsenic, have been much employed, and apparently with benefit in some cases, but they seldom can be continued for any great length of time, owing to their liability to produce evil effects upon the health. Belladonna has the strong recommendation of the medical profession, who advise its administration either as a pill composed of the extract and powdered leaves, or in the form of atropine, in gradually increased doses, and continued for a length of time. This drug certainly succeeds in many cases in diminishing the number of the attacks, but it has not yielded such encouraging results as have been attained by the bromide of potassium, which is the remedy now generally employed in the treatment of epilepsy.

℞ Bromide of Potash .....one ounce
Peppermint-water .....three ounces
Mix.
Dose: One teaspoonful three times a day, after meals.

The salt, given in from ten to thirty grain doses three times a day, is generally followed with some amelioration of the symptoms in regard to either the severity or the frequency of the attacks, and, in a few instances, with apparent cure. Its employment, moreover, can be persevered with for a long time with little inconvenience. The amount of bromide to be taken varies greatly, depending upon the effect produced. In cases where the fits appear at regular intervals it usually suffices to take the bromide for a few days prior to the expected onset. In any case, the bromide must be persevered with for a long time after the fits have ceased, many authorities say for two or three years, if a return is to be prevented, and when the drug is finally left off its abandonment should be gradual. Sometimes the combination of bromide of potassium, bromide of sodium, and bromide of ammonium suits better than the single bromide; in other cases, particularly, it is said, those of nocturnal epilepsy, digitalis combined with one of the bromides appears to aid its effect.

℞ Infusion of Digitalis .....six ounces
Dose: One tablespoonful three times a day, before meals.

Cannabis indica, borax, and antipyrine are other drugs which have been advocated of late as useful in occasional cases.

The following remedies have also been found beneficial:

℞ Fowler's Solution .....one ounce
Dose: Five drops in half a glass of water, three times a day for two weeks.

Or:

℞ Atropine Sulphate ...one-hundredth-grain tablets
Dose: One tablet half an hour after each meal.

As helps to these drugs, counter-irritation to the nape of the neck by blisters is sometimes attended with benefit.

DISEASES AND INJURIES OF THE BRAIN

The signs of brain disease are in general very indirect, being manifested by some defect in sensation or in the power of action, or by some peculiarity of conduct. The following are some of the conditions more exclusively connected with the brain.

Abscess of the Brain is a very serious condition. It results from wounds of the scalp which suppurate and in which the matter does not get free exit, or, far more commonly, from suppurating ear disease, in which the discharge from the ear has been stopped. The symptoms are rather vague, but there are always great headache and vomiting, with generally rise of temperature, and often some interference with vision. The treatment should be prevention, by keeping every scalp wound clean, and by having every case of discharging ear disease under medical supervision. When an abscess has occurred, the only escape from death is by operation to open the skull and evacuate the abscess, when most cases do well.

Anemia of the Brain is the cause of fainting when suddenly brought on by weakness of the heart's action. Anemia of a more chronic type is a very frequent cause of sleeplessness in elderly persons, accompanied by weakness of mental power and drowsiness during working hours. It causes also headache, giddiness, and ringing in the ears. The treatment is complete rest in bed and administration of tonics, and abandonment of work for a time.

Compression of the Brain may be caused by the growth of a tumor in the brain, a collection of blood between the brain and skull from injury of the membranes, or suppuration in the same locality from a neglected scalp wound or fracture of the skull. Unconsciousness coming on some hours after a blow on the side of the head is generally due to a fracture tearing one of the arteries in the membranes and producing a large clot between the skull and brain. The symptoms are vague, but, in addition to unconsciousness, there are generally difficulty of breathing, feeble pulse, and paralysis down one side of the body. The treatment is trephining of the skull to let out the blood or pus. The condition is extremely serious.

Concussion of the Brain is a bruising of part of the brain as the result of a blow on the head (generally at the back) or a severe shake of the body. Cases vary in severity from mere giddiness and headache for an hour or two, to complete loss of consciousness, lasting for weeks, and include those curious instances of lost memory for facts or even for personal identity which have been much used by novelists. The person lies unconscious and can be roused with difficulty. If he answers questions at all he does so irrelevantly, and shows great irritability of temper, going off at once again to sleep. He lies turned away from the light, with his knees drawn up on the body. Consciousness and convalescence come on very gradually, and for months there may be loss of memory, bad temper, and great susceptibility to the effects of alcohol. Recovery is generally good, but a tendency to epilepsy, or even insanity, may remain. The treatment is complete rest in a darkened room, fluid food, cold to the head; the urine often requires to be drawn off by catheter, and purgatives are necessary.

Brain Fever is a popular name for two conditions, one being a state of nervous prostration following some severe mental strain, which is not very serious, and the other being an inflammation of the membranes of the brain, occurring usually in children, or in persons suffering from consumption, which is almost always fatal.

Hemorrhage into the brain causes apoplexy.

Laceration of the Brain may occur in fracture of the skull. When on the upper part of the cerebrum, it is not of so great importance as the fact of whether the wound is kept clean and

free from suppuration, although near the fissure of Rolando damage to the brain may result in paralysis of some limb. When at the base, death usually ensues.

Softening of the Brain is a term used in a strictly scientific sense and in a popular sense. In the former case an actual area of brain tissue softens owing to its blood-supply being cut off by plugging of its blood-vessels, or in consequence of some long-standing inflammatory process. The symptoms are then those of apoplexy, though not so sudden as if the cause were hemorrhage. In the popular sense, when persons who have been the subjects of gout, alcoholism, or syphilis, especially elderly persons, become gradually dull in intellect, drowsy, absent-minded, emotional, and finally imbecile, in consequence of their diseased blood-vessels diminishing the blood-supply to, and causing deterioration of, the brain, these symptoms are also attributed to softening of the brain.

The following prescription is valuable in cases of brain anemia:

℞ Nitroglycerine ..... one-hundredth-grain tablets
Dose: One tablet every three hours, taken with a little water.

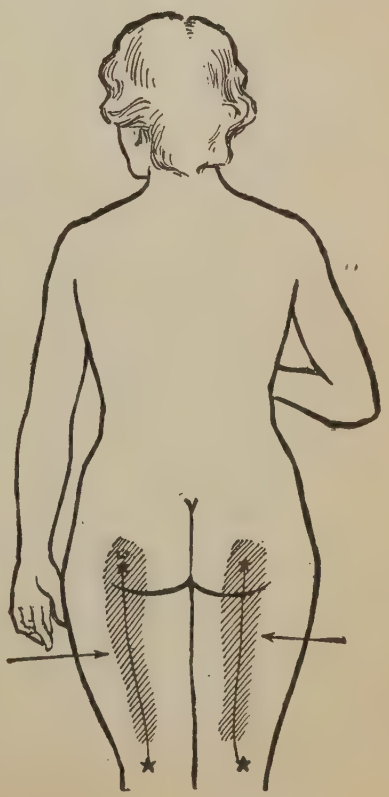
Tumors of the Brain produce very insidious and very complex symptoms, depending on the region they affect. Among the general symptoms are headache, giddiness, vomiting independent of food, and tenderness of the head on pressure. Blindness and mental symptoms come on later, owing to rise of pressure inside the skull. Sometimes these tumors are tuberculous or syphilitic in origin, when the general treatment for these diseases may be of some help, but otherwise little good can be done, except palliation of the pain by trephining to relieve the pressure.

LOCOMOTOR ATAXIA—TABES DORSALIS

Definition.—Locomotor ataxia, also called progressive locomotor ataxia and posterior spinal sclerosis, is a disease of the nervous system, manifesting itself principally by disordered movements of the limbs in locomotion. This disorder is not, as was once supposed, a form of paralysis (there being no diminution of

muscular strength), but is dependent on the loss of the power of coördinating the muscles into harmonious action, which is essential to the proper performance of the voluntary movements of the body, and the maintenance of its equilibrium.

Causes.—The pathological condition giving rise to locomotor ataxia is disease of a certain portion of the spinal cord, viz., the posterior columns and the posterior nerve-roots. These undergo various transformations, which result in their ultimately becoming atrophied and hardened. When affecting, as this lesion most commonly does, the lower dorsal and lumbar regions of the cord, the ataxic symptoms are chiefly confined to the legs; but when it affects the cervical portion, the arms are involved. Occasionally the whole posterior columns of the cord are found diseased. The exciting causes of the malady were formerly supposed to be, in different cases, exposure to cold and privation, intemperance, overexertion, and mental anxiety, but it is now held by most authorities that in the great majority of cases the disease is a remote result of syphilis. In some instances the disease appears to be hereditary. Locomotor ataxia is much more common among men than among women. It is a disease of middle life, being most frequently observed to occur between the ages of thirty and fifty.



Symptoms.—Locomotor ataxia usually begins insidiously, and advances slowly. Among the earlier symptoms observed are disorders of vision, with occasionally temporary or permanent paralysis of some of the cranial nerves, a feeling of uneasiness in the back, accompanied with violent shooting pains down the limbs, as indicated by the shaded area in accompanying illustration, decreased or perverted sensibility in various parts of the body, and disturbance of the genito-urinary functions. Among the early

signs of the disease discovered by the physician, two of the most important are: loss or diminution of the knee-jerks obtained on tapping the patellar tendon; and a sluggish condition of the iris of the eye, which, though altering the size of the pupil as the eye accommodates itself for vision of near objects, fails to contract normally when a bright light falls upon the eye. These initial symptoms may continue without much change for a long period, but generally, in the course of time, others are superadded, which give more definite intimation of the existence of the disease, and render its diagnosis a matter of little difficulty. The sufferer begins to be aware that he cannot walk with the same freedom as before, and he feels as if some soft substance were interposed between his feet and the ground. His gait assumes a peculiar and characteristic appearance. He begins the act of walking with evident difficulty, and his steps are short and hurried. Each foot is lifted well from the ground; but as he moves forward it is thrown out from him, and his heel descends forcibly, and is followed at a longer than the normal interval by the sole. In walking, he requires the aid of his vision to preserve his equilibrium, and he therefore looks at his feet, or rather at the ground a little in front of them, as he advances. He cannot turn about suddenly without the risk of falling.

Treatment.—From the nature of the structural changes affecting the spinal cord in locomotor ataxia, it is evident that, beyond the employment of means to alleviate the various painful symptoms, little can be done toward its cure. Numerous medicines have from time to time been brought forward, as supposed to possess special efficacy in the treatment of this disease, but none of them has proved to be of much value. In the earliest stages of the disease the remedies appropriate to syphilis, viz., mercury, iodide of potassium, and salvarsan, may be employed. Probably most good will be found to result from careful efforts to maintain the general health by a well appointed diet and regimen. Of late years a new form of treatment has been much employed. This consists in making the patient perform several times daily, with great care, a series of carefully coördinated movements. As he becomes gradually more expert, the exercises, which were at first very simple, are made more and more difficult, and thus new paths in the spinal cord are educated to take the place of those which the disease has destroyed. As a

result the symptoms may be temporarily abolished, and even patients who have become bedridden may regain the power of walking.

The following prescription has, however, been beneficial in some cases:

℞ Red Iodide of Mercury..one-twentieth-grain tablets
DOSE: One tablet three times a day after meals.

Together with the above is taken the following:

℞ Iodide of Potassium.....two teaspoonfuls
Wintergreen-water .....three ounces
DOSE: One teaspoonful in a wineglass of water, half an hour after meals.

DISEASES OF THE SPINE AND SPINAL CORD

The diseases of the spine and spinal cord are considered together because the chief danger of interference with the spinal column lies in the risk of injury to the spinal cord and nerves. Only some of the chief diseases will be dealt with.

Lateral Curvature of the Spine, or scoliosis, consists chiefly in bending of the spine over to one side, though, in consequence of the vertebræ being broader in front than behind, this is accompanied by a certain amount of twisting of the vertebræ round their vertical axis. The shape of the chest becomes in consequence markedly altered, the ribs on one side projecting behind at their angles, and causing the shoulder-blade to be very prominent, while on the other side the chest is flattened. The shoulder of the bulging side is usually considerably elevated. This condition may be started by slight injuries of the spine, by rickets in early life, or by diseases in the chest, such as pleurisy, which cause partial collapse of one side. But by far its most common occurrence is in young persons of feeble muscular power, especially in rapidly growing girls from about twelve to sixteen years of age, who adopt some bad habit of posture. Such a habit may consist of crossing one leg over the other always in sitting, leaning constantly on the same elbow at lessons, standing habitually with the weight of the body on one foot, or frequently carrying a heavy burden on one arm.

The consequences of this deformity are a bad carriage and

awkward gait, while, if it be very marked, the lungs and other internal organs are liable to be attacked by various diseases, though there is no tendency for the spinal cord to suffer any damage.

Treatment consists in avoiding the bad postures mentioned above, and in making sure that the general health is maintained as high as possible by tonics, fresh air, and exercise. Above all, some special form of gymnastics, combined sometimes with massage, is advisable in order to strengthen the feeble muscles of the back. It is only in extremely marked cases that the strait-jackets and other mechanical supports, formerly so much in vogue, are needed to prevent increase in the deformity.

Angular Curvature of the Spine, or Pott's Disease, is a very much more serious condition. It not only produces more evident deformity, but many cases are accompanied by a certain degree of pressure upon the spinal cord. This deformity is produced in the great majority of cases by caries of the vertebræ, the result of tuberculosis; and, the body of one or more vertebræ crumbling away, the spinal column curves sharply forward, so that the spinous processes stand out very prominently at the site of the disease. A similar condition occasionally comes on after a fall in the case of a young child, or a severe blow upon the back of an older person. The symptoms are not at all well marked in the early stages. There is a general loss of health and strength, and the person becomes easily tired. The affected part of the spine is tender when pressure is made on the back, and the child holds himself stiffly. If the neck be diseased the head is not turned from side to side, and the child often supports the chin on his hand. If the back be the part concerned, the child holds himself very erect, and when he wishes to pick something off the floor goes down upon his knees rather than bend the back. When the lumbar region of the spine is diseased a frequent result is the formation of an abscess which burrows toward the back or down into the groin.

Treatment applicable to tubercular disease affecting any other organ, such as good food, tonics, and fresh air, is most important. In an early case the patient must rest upon his back for many months, and in more advanced cases some form of mechanical support is in addition necessary. The region of the thorax, where the condition is commonest, is generally supported by a

jacket of poroplastic felt or of plaster of Paris, and when the disease attacks the neck, a padded collar or a jury-mast is used to support the head. Good results are often obtained by an operation in which diseased bone is scraped away, and new bone transplanted. After the disease has been arrested and the bone has healed up, a considerable amount of permanent stiffness and deformity results.

The following tonic is recommended:

℞ Emulsion of Cod-liver Oil with
Phosphates.....one pint

Dose: One tablespoonful half an hour after meals. In children, the dose is reduced to one teaspoonful.

Caries of the Spine is the condition of tubercular disease, usually found in the body of one or two neighboring vertebræ, which leads to angular curvature.

Compression of the Cord may arise from various causes. The seriousness of most diseases affecting the spine is, in fact, measured by their tendency to interfere with the spinal cord. This condition may be caused suddenly by a severe crush or blow upon the back, which produces a fracture of the spine with displacement of the fragments. Or it may come on slowly, and is then in the great majority of cases due to Pott's disease. Compression of the cord in the neck is speedily fatal as a rule, owing to the involvement of important vital centers; but when it occurs in the region of the chest, the person may live a long time as a more or less helpless invalid.

The symptoms comprise interference with sensation below the level of compression, and, in chronic cases, pain round the body at this level; rigidity and paralysis of the lower limbs more or less complete; interference with the functions of the bladder and rectum, and a special tendency to bed-sores in the paralyzed parts.

Treatment, in cases due to accident, is not as a rule hopeful, since the spinal cord is generally lacerated, as well as compressed, by the damage to the spine. But cases which come on slowly as the result of Pott's disease very frequently yield to treatment. This consists in prolonged rest and support to the spine; while brilliant results are often obtained by an operation

designed to remove the bone or inflammatory product which is pressing upon the cord, even after several months of complete paralysis. Apart from the question of recovery, these cases require special care and watchfulness in nursing because of the great tendency to the formation of bed-sores, so that it would be advisable to give daily an alcohol rub. The patient may also lose to a great extent the power of voluntary control over the bladder and bowels.

In most cases the following will be found to be beneficial:

℞ Urotropine .....five-grain tablets
Dose: One tablet dissolved in half a glass of water, three times a day.

Syringomyelia is a disease of the spinal cord in which fissures and cavities exist in the cord in connection with the central canal. The gray matter in this disease also is much disorganized. The early symptoms present considerable resemblance to those of wasting palsy, but there is, in addition, a peculiar disturbance of the sensory functions; for, while the sense of touch is unimpaired, there are areas on the limbs over which the capability of feeling pain is lost.

APHASIA—LOSS OF VOICE

Definition.—Aphasia is a partial or complete loss of the power of speech, due to injury to the centers which govern this act in the brain. The higher of these centers, which have to do with forming the ideas of speech, putting words together in sentences, and governing the movements of mouth, tongue, and larynx, lie on the surface of the cerebral hemispheres, especially of the left; while the lower centers, which directly bring the muscles of the voice organs into action, under superintendence of the higher ones, are in the medulla or hind brain.

Causes.—The cause is destruction of a portion of the brain, including one of these higher centers, owing to rupture of a blood-vessel, and hemorrhage into the brain tissue; or, more often, owing to blocking of a blood-vessel by an embolus, or by clotting of the blood on the diseased wall of a vessel, any one of which cuts off the supply of blood to the part concerned. The

causes are thus the same as in apoplexy, and aphasia may be one of the symptoms of an apoplectic seizure, especially when the right side of the body is paralyzed; or may occur by itself, according to the extent of the brain involved. Other diseases, such as tumors, may also be the cause, the important factor being interference with the functions of certain definite areas of the brain.

Symptoms.—The disorder generally follows an attack of apoplexy and exists along with some paralysis on the right side of the body. When the right side of the brain, on the other hand, is injured, the result is paralysis on the left side of the body, accompanied usually by more or less amnesia, or forgetfulness. Aphasia may come on suddenly and last only a few hours or days, being due then to a passing congestion of the brain, or to a block in the circulation, which is later swept away. Generally it is permanent, and, naturally, a person with aphasia has always some mental impairment. Sometimes he is absolutely without the power of speech, though often a few interjections, like "Oh dear," "Yes," or "No," or meaningless sounds, or even oaths, can be pronounced. When the condition is one of sensory aphasia, names of persons, of places, even of the commonest household articles, are forgotten, a cat is called "a brush," a bell "a pen," and so forth, or the person gives meaningless answers to questions, so that conversation becomes very slow or quite impossible.

Treatment.—This is just as in apoplexy, of which the condition often forms a part. The condition is seldom much improved if it has lasted more than a week without betterment. But in some cases, after the hemorrhage or other cause is long past, brilliant results are achieved by teaching the afflicted person to read and speak just as one would teach a child, a new part of the brain apparently being educated.

If associated with apoplexy, use the following:

℞ Iodide of Potash.....four teaspoonfuls
Iodide of Soda.....four teaspoonfuls
Peppermint-water .....three ounces

Dose: One teaspoonful, diluted in water, every four hours.

CATALEPSY

Definition.—Catalepsy is a term applied to a nervous affection characterized by the sudden suspension of sensation, accompanied with a peculiar rigidity of the whole or of certain muscles of the body. The subjects of catalepsy are in most instances females of highly nervous temperament.

Causes.—The exciting cause of an attack is usually mental emotion operating either suddenly, as in the case of a fight, or more gradually in the way of prolonged depression.

Symptoms.—The symptoms presented vary in different cases, and even in the same individual in different attacks. Sometimes the typical features of the disease are exhibited in a state of complete insensibility, together with a statue-like appearance of the body, which will retain any attitude it may be made to assume during the continuance of the attack. In this condition the whole organic and vital functions appear to be reduced to the lowest possible limit consistent with life, and to such a degree as to simulate actual death. At other times considerable mental excitement will accompany the cataleptic symptoms, and the patient will sing or utter passionate exclamations during the fit, being all the while quite unconscious. The attack may be of short duration, passing off within a few minutes. It may, however, last for many hours, and in some rare instances persist for several days; and it is conceivable that in such cases the appearance presented might be mistaken for real death, as is alleged to have occasionally happened. Catalepsy belongs to the class of functional nervous disorders, of which the pathology is but little understood, owing to the manner in which morbid physical and psychical conditions are mixed up. Although it is said to occur in persons in perfect health, careful inquiry will usually reveal some departure from the normal state, as is shown by the greater number of the recorded cases.

Treatment.—From what has been stated it follows that the successful treatment of such a disease as catalepsy must depend upon the due recognition of both its corporeal and mental relations. While the state of health will demand the attention of the physician, his skill and judgment will be no less urgently called for in dealing with the mental and moral characteristics

manifested in each particular case. Some physicians have shown that efforts directed to obtain command of the patient's will, so as to compel resistance to the utmost of the inclination to fall into the cataleptic state, may succeed in curing even aggravated examples of this disease. As a sedative in highly nervous cases, the following may be taken:

℞ Bromide of Sodium.....five-grain tablets
Dose: One tablet every three hours until rest is obtained.

TETANUS—LOCKJAW

Definition.—Tetanus is a disorder of the nervous system, consisting in a greatly increased excitability of the spinal cord and manifesting itself by painful and lengthened spasm of the voluntary muscles throughout the body.

Causes.—The disease shows itself under various conditions. It sometimes occurs, particularly in tropical countries, where the dark races are oftener affected than Europeans, without apparent cause, and has been known thus to affect numbers of persons simultaneously (*idiopathic tetanus*). It is sometimes observed in new-born children (*trismus neonatorum*) and in pregnant women (*puerperal tetanus*). But by far the greater number of cases occur in connection with a visible wound or other injury, more especially in the extremities, probably implicating some of the peripheral nerves. Certain forms of injury, as punctured, lacerated, and gunshot wounds, are more liable to be followed by tetanus than others. In many cases the liability bears no proportion to the extent of the wound, and it is highly probable that even those idiopathic cases mentioned above are preceded by infection through some slight wound which on account of its triviality has passed unnoticed. Exposure to cold after injury is an important predisposing cause.

Symptoms.—The symptoms of tetanus in its most usual forms generally appear during the healing process of a wound, but occasionally they arise after the surface is completely closed. Sometimes they are preceded by appearances of irritation in the wound or its neighborhood, but this is exceptional. The earliest indications of the disease usually show themselves as stiffness in the muscles near the wound, followed later, no matter where the wound is situated, by stiffness about the muscles of

the jaw, causing difficulty in opening the mouth, which soon increases to *lockjaw,* or trismus. This is accompanied by spasm in neighboring muscles, and the drawn features and exposed teeth give to the countenance the peculiar expression known as *risus sardonicus.* The rigidity extends to the muscles of the neck, back, chest, abdomen, and extremities, and the body frequently assumes a bent attitude, either backward, forward, or laterally. This general muscular rigidity, which at first is not constant but occasionally undergoes relaxation, is accompanied by frequently recurring convulsive seizures, which are readily excited by the slightest irritation, such as from a draft of cool air, a bright light, the closing of a door, etc. In such attacks there is great suffering and the expression of the face is indicative of agony; the function of respiration may be seriously involved and asphyxia threaten or actually take place. The temperature of the body sometimes rises to a high degree. The attack is usually acute and after a few days either passes off, or, as is more frequent, terminates fatally, either by asphyxia from prolonged spasm of the respiratory muscles, or exhaustion consequent on the violence of the symptoms, together with the absence of sleep. Throughout the whole course of the disease the mind is clear. In idiopathic tetanus the symptoms are less severe, the course more chronic, and recoveries more common than in those which depend upon a distinct wound or injury. The puerperal form, with symptoms which differ in no way from those described, is rare and occurs after childbirth. Tetanus in new-born children, also a rare form, usually shows itself a day or two after birth by obvious difficulty in the acts of sucking and swallowing; by the supervention of lockjaw, together with prolonged contraction of the muscles of the limbs and body, sometimes accompanied by convulsive seizures; and by a peculiar low whining cry, seldom absent and very characteristic.

Treatment.—For the treatment of tetanus many remedies have been employed. When a source of irritation in or about a wound can be found, it ought to be dealt with by the surgeon. Of medicinal agents, those which diminish the reflex excitability of the spinal cord and relax the spasm are to be recommended. But it is not safe to employ all substances which produce these effects. Thus tobacco and its active principle nicotine act powerfully in this way, but they are attended with danger from their

poisonous properties, and the same may be said of curari, conium, Calabar bean, etc., all of which have been used in tetanus. Opium carefully administered sometimes produces a markedly beneficial effect, as does also Indian hemp. Chloroform or ether inhalation greatly mitigates the severity of the spasm. Chloral hydrate and bromide of potassium or ammonium are among the most useful agents which can be employed, and they may be given separately or, still better, in combination.

℞ Bromide of Potash.....four teaspoonfuls
Bromide of Ammonium.....four teaspoonfuls
Chloroform-water .....three ounces
Mix.
Dose: One teaspoonful every three hours; water may be given after the medicine.

As aids, the warm bath, the absence of all noise and excitement, and the maintenance of the strength by appropriate nutriment should not be neglected.

An antitoxic serum has been prepared, and its use has been attended by great benefit in the case of operations upon animals, like the horse, which are liable to contract tetanus. In human beings, however, the results of its injection for the cure of tetanus have been very disappointing. This is probably due to the fact that the disease has obtained a firm hold upon the nervous centers before marked symptoms appear and call for the use of the antitoxine. To be of any use this serum must be injected at the earliest possible moment.

APOPLEXY

Definition.—Apoplexy means a stroke of sudden insensibility or of bodily disablement connected with some diseased condition of the brain. The term apoplexy is sometimes applied to an extravasation of blood within the substance of any organ, as, for instance, into the lung, causing pulmonary apoplexy. This use of the word, however, is altogether objectionable.

Causes.—Different forms of apoplexy have been described by medical writers, such as the *congestive,* where the cause appears to lie in an engorgement of the blood-vessels of the brain and its membranes; the *serous,* where sudden effusion of fluid

into the ventricles or substance of the brain causes symptoms of apoplexy in persons the subject of kidney disease; and the *spasmodic,* where spasm of the arteries brings on a temporary paralysis or loss of speech in elderly persons.

In persons who are the subject of heart disease, a clot may form in the cavities or on a valve of the heart, and being carried away by the blood-stream may lodge in a vessel of the brain so as to form a plug which prevents blood from reaching the part supplied by the vessel in question. The occurrence of this *embolism* is absolutely sudden and produces all the symptoms of apoplexy. This is not a common cause of apoplexy, though when it occurs the prospect of improvement is better than when the apoplectic symptoms are due to hemorrhage. In elderly people whose blood-vessels are extensively diseased and whose circulation is feeble, a type of apoplexy, of more gradual onset, may appear in consequence of the blood clotting in the interior of the vessels, this process being known as *thrombosis.*

By far the most frequent and important occasion of apoplexy is *hemorrhage* into the brain by the rupture of blood-vessels. Indeed, by many modern writers the term apoplexy is applied only to cases of cerebral hemorrhage. The blood-vessels of the brain, like those in other parts of the body, are liable to undergo degenerative changes after middle life. These changes affect the minute arteries as well as the larger vessels, rendering their texture fragile, and at the same time impairing their function in carrying on the healthy nutrition of the brain. Hence, in the immediate vicinity of the diseased blood-vessels the substance of the brain itself undergoes degeneration and becomes softened. The small vessels, having thus lost their natural support of the surrounding tissues, and being here and there distended into aneurisms by disease, are liable to give way, and blood escapes into the brain.

A hereditary tendency is one of the predisposing causes of apoplexy, as are also diseases of the heart and kidneys. With respect to the exciting causes of a fit of apoplexy, it may be stated generally, that whatever tends directly or indirectly to increase the tension within the cerebral blood-vessels may bring on an attack. Immoderate eating or drinking, severe exertion of body or mind, violent emotions, much stooping, overheated rooms, exposure of the head to the sun, sudden shocks to the

body, and the sudden suppression of evacuations, such as the menstrual discharge, may precipitate the fit.

Symptoms.—Apoplectic attacks vary both as regards their intensity and their attendant phenomena, but well marked cases present the following symptoms. The person attacked becomes, more or less suddenly, deprived of consciousness and all power of voluntary motion. He lies as if in a deep sleep, with a flushed face, a slow pulse, stertorous breathing, accompanied with puffing of the cheeks during expiration, and with the pupils of the eyes insensible to light, and contracted or unequal. This state in many respects resembles the coma of narcotic poisoning, and is unfortunately too often mistaken by unskilled persons for alcoholic intoxication.

The presence of complete paralysis down one or other side is a point which in general differentiates apoplexy from narcotic poisoning and alcoholic intoxication, the paralysis being observable even during unconsciousness by lifting the limbs and noting the peculiar suddenness and helplessness with which they fall when not supported. The fact that in either of the last named conditions the person can generally be partially roused, while in apoplexy unconsciousness is complete, is also valuable. Assistance is also gained by observing the state of the pupils, which in narcotic poisoning are usually much contracted, while in alcoholic intoxication they are widely dilated.

In this condition of insensibility death may occur within a few hours, or there may be a gradual return to consciousness, in which case it is frequently observed that some trace of the attack remains in the form of paralysis of one side of the body.

Although generally sudden in its onset, it is seldom that an attack of apoplexy occurs without some previous warning. Persistent headaches of a dull throbbing character, a sense of fullness in the head, vomiting, giddiness, noises in the ears, slight confusion of mind, and numbness of a limb or of one side of the body are among the more important premonitory symptoms; and these may exist for a variable length of time before the fit comes on. Such symptoms, especially in a person known to be gouty or the subject of kidney disease, at or beyond middle life, indicate danger of an apoplectic seizure.

Treatment.—A knowledge of these facts is of the utmost importance in the treatment of apoplexy, as obviously much can

be done in the way of warding off fits where they appear to threaten, and of preventing a recurrence in cases where there have been previous attacks. With respect, further, to the treatment of apoplexy, it must be admitted that little can be done during the state of unconsciousness, though the great importance of absolute quiet, with the body in the recumbent position and the head supported on a low pillow, cannot be too strongly impressed.

A strong purgative like jalap powder, or if the patient be unable to swallow, a drop of croton oil in butter or milk laid on the tongue, is given for a similar purpose. Warmth to the surface of the body and cold cloths laid on the head are helpful. The case must be anxiously watched, and symptoms treated as they arise. When consciousness returns, care and quietness are necessary to prevent recurrence of the hemorrhage or development of extensive softening of the brain. The diet must be low for some time after the attack, and the period of convalescence should be prolonged.

℞ Tincture of Aconite.....two drams
Dose: Seven drops at once, and three drops every half-hour for three doses.

To move the bowels of the unconscious patient, use the following:

℞ Calomel .....three grains
Sugar of Milk.....one dram
Mix, and make into twelve powders.
Dose: Place one on the tongue every half-hour.

NEURITIS

Definition.—Neuritis means inflammation affecting a nerve or nerves, which may be localized to one part of the body, as, for instance, in sciatica, facial neuralgia due to this cause, etc., or which may be general, being then known as multiple neuritis, or polyneuritis.

Causes.—In cases of localized inflammation the fibrous sheath is usually at fault, the actual nerve-fibers being only secondarily affected. This condition may be due to inflammation spreading into the nerve from surrounding tissues, to cold, or to long-continued irritation by pressure on the nerve, and the symptoms

produced vary according to the function of the nerve, in the case of sensory nerves being usually neuralgic pain, in the case of motor nerves more or less paralysis in the muscles to which the nerves pass.

In multiple neuritis, which is always due to some general or constitutional cause, the nerve-fibers themselves in the small nerves degenerate and break down. Hence the very protracted nature of this malady, since, if recovery takes place, it must be brought about by the growth of new nerve-fibers from the healthy part of the nerve, down the sheath of the nerve, to the muscle. The cause of this degeneration may be said, in general terms, to be in every case some poison either taken into or produced in the body, and circulating in the blood. The commonest of these poisons is alcohol. Next in importance comes lead, wrist-drop and other features of neuritis being among the most prominent symptoms of lead poisoning. Arsenic is occasionally responsible for neuritis, particularly when the effect of arsenic is combined with over-indulgence in alcohol.

Symptoms.—The chief symptom of a localized neuritis, whether pain or paralysis, has been already stated to vary according to the function of the nerve. The area of skin associated with the affected nerve is, in addition, often much changed, becoming glossy, or developing an ulcer, or, especially about the face and trunk, breaking out in shingles. A case of neuritis of this type may come on very quickly, developing fully in a few days.

Multiple neuritis, as a rule, takes longer to show itself, even in the case of diphtheria seldom developing till two or three weeks after the onset of the trouble in the throat. In most cases it begins with vague pains and tingling in the limbs, and particularly in the shoulders, as indicated by the shaded area in the accompanying illustration; weak-

ness and wasting of the muscles in the feet and legs, in the hands and arms, or in other parts, following later. Wrist-drop, the peculiar "steppage" gait in which the person lifts his feet as if he were constantly stepping over small obstacles, squinting, loss of voice, difficulty of breathing, enfeeblement of the heart's action appear according to the muscles whose nerves are affected. There is usually some loss of sensation in scattered areas over the skin, but a very characteristic sign, in the alcoholic form of neuritis at least, is that the muscles are extremely tender when squeezed. There is almost always some swelling of the feet, and in the neuritis of beriberi dropsy is often a very marked symptom. The knee-jerks and other deep reflexes are generally lost in all forms of neuritis, if severe in character. A peculiar feature of alcoholic neuritis is the wandering delirium from which the patient often suffers, the imagination conjuring up the most vivid hallucinations as to journeys he is making, people with whom the patient is conversing, etc.

The course of the disease is, as stated above, usually very slow, and particularly is this the case when a poison, as in the case of alcohol or lead, has been taken into the system over a long period. Months, or even a year or two, may elapse in one of these cases before the health is restored. The ultimate hope of recovery is, however, good. Except in the case of beriberi, which is a very fatal malady, and in those cases of poisoning by alcohol, or of diphtheria, in which the mechanism of the heart or that of respiration becomes affected, the mortality is low.

Treatment.—The treatment for localized neuritis is the same as for neuralgia. The first essential in the treatment of multiple neuritis is to discover and remove the cause by which the nerves are being poisoned. Particularly does this apply to alcoholism, lead poisoning, and neuritis due to manufacture of india-rubber. In the case of alcoholism there is always present the moral difficulty of preventing the patient from obtaining fresh supplies of stimulants, so that treatment must be carried out in a hospital or nursing-home. Rest in bed is the next essential, to prevent over-fatigue of the weakened nerves and muscles. In the early stages the muscles are too tender to permit of much handling, but later on massage helps to prevent the wasting of muscles which always occurs to a greater or less extent, and the deformities which arise through fixation of the joints in one position.

These deformities must be prevented as far as possible from arising during the earlier stages by frequently changing the position of the patient's limbs as he lies helpless in bed. Various forms of electrical application have also a beneficial effect in exercising and promoting the nutrition of the muscles, as recovery advances. The drug whose use is attended with most benefit is strychnine, and it is often given during convalescence, as well as iodide of potassium.

The following prescriptions have been used with good results:

℞ Sodium Salicylate.....two drams
Make into twelve powders.
Dose: One powder every three hours.

Or:

℞ Strychnine Sulphate.....one-sixtieth-grain tablets
Dose: One tablet three times a day.

Or:

℞ Bromide of Potash.....four teaspoonfuls
Peppermint-water .....two ounces
Dose: One teaspoonful in a wineglass of water, after meals.

Keep the painful parts constantly wrapped in flannel saturated with the following solution:

℞ Chloroform .....two and one-half drams
Tincture of Aconite.....two and one-half drams
Tincture of Iodine.....two and one-half drams
Ammonia-water .....two and one-half drams
Soap Liniment.....two and one-half drams
Mix.
Directions: For external use, apply over painful part.

Or:

℞ Epsom Salts .....one ounce
Hot water .....four fluid ounces
Mix.
Directions: Apply hot.

Or:

℞ Menthol .....one fluid dram
Compound Soap Liniment .....two ounces
Mix.
Directions: Apply locally and wrap parts.

NEURALGIA

Definition.—Neuralgia is a term which is frequently employed, both technically and popularly in a somewhat loose manner, to describe pains the origin of which is not clearly traceable. In its strictest sense it means the existence of pain in some portion or throughout the whole of the distribution of a sensory nerve, without any distinctly recognizable structural change in the nerve or nerve centers.

Causes.—It may be generally stated that neuralgia rarely occurs in the midst of good health, its existence betokening, as a rule, a depressed or enfeebled state. Constitutional causes, hereditary or acquired, are among the most powerful of the predisposing influences in its production. Thus it is often found to affect the rheumatic or gouty. In weakened conditions of the system from unsuitable or insufficient food, or as the result of any drain upon the body, or in anemia from any cause, or when certain disease poisons are present, such as syphilis or malaria, it is common for neuralgia to come on. Further, any strain upon the nervous system, such as mental overwork or anxiety, is a powerful predisposing cause. Among the exciting causes of an attack of neuralgia, by far the most common is exposure to cold and damp, which seems to excite irritation in a nerve already disposed to suffer. But irritation may be produced by numerous other causes, such as bruising of a nerve by a blow, decayed tooth, diseased bone, local inflammations in which nerves are implicated, or some source of pressure upon a nerve trunk.

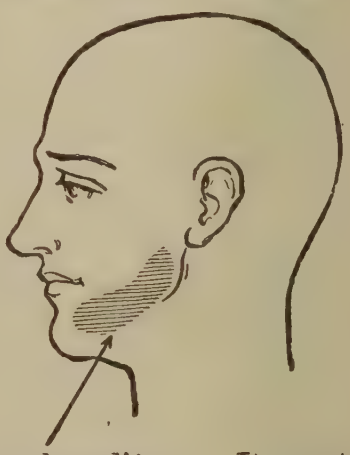
Symptoms.—There are few ailments which give rise to greater human suffering than neuralgia, and though the pain is generally localized, it may spread beyond the area where it first occurs. It is usually of paroxysmal character, and often periodic, that is to say, it occurs at a certain time of the day or night. It varies in intensity, being often of the most agonizing character, and again less severe and more of a tingling kind. Various forms of perverted nerve function may be found along with or following neuralgia. Thus there may be over-sensitiveness of the skin, loss of feeling, paralysis, or alteration of nutrition, such as wasting of muscles, whitening of the hair, etc. Attacks

of neuralgia are apt to recur, particularly when the general health is low, and some persons unhappily continue to suffer from occasional attacks during the greater part of their lifetime.

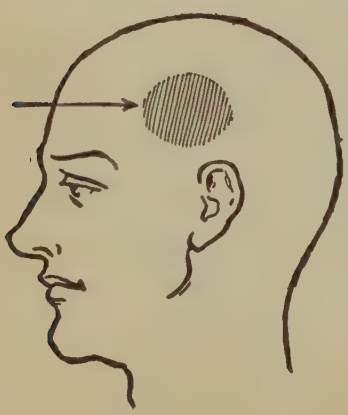
Varieties.—The nature of the disease will be best described under the names of the forms in which it most commonly occurs. These are facial neuralgia, or tic douloureux; migraine, also known as brow-ague; and intercostal neuralgia. Other forms, affecting the arm, neck, etc., are of much less frequent occurrence.

Facial Neuralgia, or *Tic Douloureux,* is one of the most common forms of neuralgia, and one of the most severe. It affects the great nerve of sensation in the face (fifth nerve), and may occur in one or more of the three divisions in which the nerve is distributed. It is usually confined to one side. Females suffer, on the whole, more frequently than males, and adults or young persons more than children or the aged. Among the more prominent conditions associated with it may be mentioned a low state of health resulting from previous disease, and drain upon the system (such as excessive menstruation, overlactation, etc.), and, very specially, overexertion of body or mind and mental anxiety. The attack is often precipitated by the irritation of a decayed tooth or by exposure to cold air. When the first or upper division of the nerve is involved, the pain is mostly felt in the forehead and side of the head. It is usually of an intensely sharp, cutting, or burning character, either constant or periodic, returning at a certain hour each day while the attack continues. Occasionally the paroxysms are of extreme violence, and are brought on by the slightest provocation, such as a draft of cool air. The skin over the affected part is often red and swollen, and even after the attack has abated, feels stiff and tender to the touch. In this, as in all forms of neuralgia, there are certain localities where the pain is more intense, these painful points, as they are called, being for the most part in those places where the branches of the nerves emerge from bony canals or pierce the fascia to ramify in the skin. Hence, in this form, the greater severity of the pain above the eyebrow and along the side of the nose. There is also pain in the eyelid, redness of the eye, and flow of tears. When the second division of the nerve is affected, the pain is chiefly in the cheek and upper jaw, as indi-

cated by the shaded area in the accompanying illustration, the painful points being immediately below the lower eyelid, over the cheek-bone, and about the upper lip. When the third division of the nerve suffers, the pain affects the lower jaw, and the chief painful points are in front of the ear and about the chin, as shown by the shaded area in the accompanying illustration. As a result of this malady, important nutritive disturbances may appear in the affected area, such as thickening of the tissues, falling out or blanching of hair, etc., as well as various alterations of sensibility. Attacks of tic douloureux, extremely distressing as they are, may recur occasionally for years; and although, by depriving the sufferer of sleep and interfering with the taking of food, they may in some measure impair the health, they rarely appear to lead to any serious results. Nevertheless, in some cases the pain is intolerable.



Migraine, Brow-ague, and *Sick-headache* are various terms employed to describe a condition which appears to be of similar nature to neuralgia. In some instances it would seem to be hereditary. It most frequently affects females, and generally occurs in early life, tending to disappear as age advances. An attack may come on suddenly, but, in general, begins by a dull aching pain in the brow or temple, as shown by the shaded area in the accompanying illustration; the pain steadily increases in severity and extent, but remains usually limited to one side of the head. It attains at times an extreme degree of violence, and is apt to be aggravated by movement, loud



noises, or bright light. Accompanying the pain there is more or less of nausea, and when the attack reaches its height vomiting may occur, after which relief comes, especially if sleep supervene.

Intercostal Neuralgia is pain affecting the nerves which emerge from the spinal cord and run along the spaces between the ribs to the front of the body. This form of neuralgia affects the left side more than the right, is much more common in women than in men, and occurs generally in enfeebled states of health. It might be mistaken for pleurisy or some inflammatory affection of the lungs; but the absence of any chest symptoms, its occurrence independently of the acts of respiration, and other considerations establish the distinction. The specially painful points are chiefly at the commencement of the nerve as it issues from the spinal canal, and at the extremities toward the front of the body, where it breaks up into filaments which ramify in the skin. This form of neuralgia is occasionally the precursor of an attack of shingles as well as a result of it.

Treatment.—With all forms of neuralgia it is of the first importance to ascertain, if possible, whether any constitutional condition is associated with the malady, and if evidence of the presence of rheumatism, gout, anemia, etc., be discovered, to administer, along with the local remedies for neuralgia, the salicylate of soda, iodide of potassium, iron, etc., required for the constitutional condition.

Naturally also one looks for, and as speedily as possible removes, any source of local irritation, such as a decayed tooth, and also any such reflex source as uterine or intestinal disorder.

During the time an acute attack lasts, various local applications give relief, the most useful being, perhaps, hot fomentations applied over the painful part. Bathing with water as hot as can be borne is also beneficial in many cases, as is also the use of a hot-water bag. Rubbing or painting with anodyne liniment, such as a mixture of the liniments of aconite and belladonna, is very soothing. Ointment of aconitine is also recommended by some to be rubbed on the painful spot. Hypodermic injections of morphine or cocaine, although they give temporary relief, are not to be recommended, because of the great danger, in such cases, that their use will become a habit.

Internally, during an acute attack, many remedies are given.

Those which are most generally useful, and which may be safely used without any tendency to bring about habitual use, are phenacetine, antipyrine, and other coal-tar preparations. When the neuralgia is of a periodic type, quinine, taken an hour or two before the expected attack, is the drug which most distinctly gives relief. Among other drugs which are often used, we have belladonna, henbane, bromide of potassium or of ammonium, and tincture of aconite.

When the neuralgia has assumed a chronic type, or when the acute attacks recur with great frequency, a totally different type of treatment is generally required. Plentiful nourishment and tonics, such as arsenic and strychnine, in these cases are often beneficial.

As regards local measures in the chronic state, the application of flaxseed poultices is the remedy most employed. The poultice is made of an oblong shape, with its length corresponding to the line of the nerve. The use of galvanic electricity is often beneficial both in the acute and chronic stages. A weak current should be used, and applications, lasting fifteen to twenty minutes, may be made daily. The negative pole should be applied to the neck or back, and the positive pole over the course of the painful nerve. Other forms of electrical application have also been tried, though their advantage is doubtful. Baths of various sorts, particularly alternate hot and cold baths, or douches, and the hot-air bath are also sometimes of use. Massage, though it increases the pain in the acute state, may be of great benefit in chronic cases due to some inflammatory process in the nerve.

The following prescriptions have been found useful:

℞ Potassium Bromide.....two drams
Fluidextract of Guarana.....one ounce
Syrup of Orange Peel.....one ounce
Water, to make.....three ounces
Mix.
Dose: One teaspoonful in water every two hours.

Or:

℞ Potassium Iodide..... four drams
Salol ..... two drams
Mix, and make into twenty-four capsules.
Dose: One capsule after each meal.

Apply the following externally:

℞ Thymol ..... one dram
Camphor ..... one dram
Alcohol ..... one ounce
Mix.
DIRECTIONS: Paint over painful area with a brush.

Or:

℞ Epsom Salts..... one tablespoonful
Hot water ..... one-half glassful
Mix.
DIRECTIONS: Keep painful parts saturated with hot applications.

INSANITY—LUNACY

Definition.—The disease termed insanity affects that part of the nervous system which determines mind and conduct. The difficulty of the study of mental disease is encountered at the very outset, for the question at once arises, What constitutes insanity and what is the idea of sanity? Where does sanity cease and insanity commence? The line of demarcation is not clearly defined; many people exhibit peculiarities of mind and perversities of conduct which throw grave doubts on their sanity, yet they are not certifiable as lunatics, and although they may eventually become so, they may, before that stage is reached, ruin themselves, their families, and even commit crime. It is with reference to the association of crime and insanity, however, that the greatest difficulty arises, and at various times different legal tests have been laid down by judges in order to determine whether or not a man was responsible for his guilty action. The knowledge of right and wrong in relation to the act committed; the presence or absence of insane delusions; a man's reputed sanity among his fellow-beings; all these tests have, at various times, been laid down as fixing or absolving from responsibility. At the present time, what decides the matter is the amount of power a man possesses of controlling his action at the time of committing the crime. If the mind is so diseased or so defective that there is complete absence of the power of self-control, then he is not held responsible, unless, indeed, this inability to exer-

cise self-control is due to his own default, as, for example, when he is intoxicated.

Causes.—(*a*) Predisposing Causes.—Certain causes may definitely be said to predispose a person to become insane. First and foremost stands *heredity.* In no disease does heredity play so important a part. Its far-reaching effects can hardly be measured, and although at the present time there is a tendency to minimize it as a factor in this and in other diseases, investigation of the family histories of those who become insane only tends to reveal its significance as a potent cause. A careful search may reveal various nervous diseases in other members of the same family all allied to the insane state; such, for example, as chorea, epilepsy, or hysteria. But even actual disease of the nervous system is not necessary. Various mental states or neuroses may become so developed as to be unnatural, and may be found in the family of a person who becomes insane. Before heredity is dismissed, then, a wide, comprehensive view of the traits, characteristics, temperament, habits, and mental processes of the family must be taken.

Intermarriage, such as the marriage of near relations, is also of importance. It frequently results in an offspring bearing, in an exaggerated degree, the characteristics of the parents, which are natural in the parent, but apt to be unnatural in the children, to the extent of their reaching even the actually insane state. This progression and evolution of traits of character is frequently seen also in the children of marriages between individuals of similar temperament, more especially when the temperament is one which can be distinctly classified as nervous.

Worry, constant mental strain, business reverses, are all to be cited as causes which tend to overturn the balance of a delicately poised brain.

(*b*) Exciting Causes.—*Toxic* cases result from poisonous substances circulating in the brain and destroying, temporarily, the functions of the nerve-cells. If the poison be known and its antidote found, nature may, by the use of the antidote, be aided in cutting short an attack of insanity before the brain-cells have been irreparably destroyed. First and foremost stands *alcohol.* Recent statistics prove conclusively that it is a terrible poison to nerve tissue; not only does it act as a frequent exciting cause where there is a hereditary predisposition, but it can also pre-

duce the disease anew. No other agent has such different results on different brains, hence the types of insanity traceable to alcoholic intemperance are varied and dissimilar. *Syphilis* is another poison whose evil effects may appear many years after it has entered the system. Various bodily diseases, such as *influenza, consumption, myxedema, exophthalmic goiter,* and *diabetes,* also produce poisonous states of the blood that may affect the brain and bring about insanity. Finally, *pregnancy,* the *puerperal state,* and *lactation* may be taken together, because the insanity connected with childbirth is the most curable of all forms, is the least apt to leave traces of mental weakness behind, and is perhaps the most universally admitted to be toxic in origin.

The processes of *development* and *degeneration* are of great importance in relation to the onset of insanity, and in this connection there are three all-important epochs in the life-history of an individual. (1) *Adolescence* is the period when the function of reproduction is attaining full development and the body is arriving at its full growth. It is during adolescence that the migraines, hysterical outbursts, and many other manifestations pointing to an unstable nervous system arise. (2) *The climacteric period* is the period when there is a distinct waning of the powers which had been fully developed at the completion of adolescence. It is important to remember that this is not a sudden change, but one that may be drawn out over a series of several years, and accompanied by various mental peculiarities. (3) *Senility* begins perhaps most usually about seventy. It is an old saying that "a man is as old as his arteries," and given a man with good heredity, with healthy arteries, which have not carried, during early life, blood laden with noxious poisons, senility may be long delayed. Heredity does not play so important a part in the insanity of the old, for it is indeed self-evident that a hereditary weakness which does not show itself till the period of old age must have been originally a slight one.

Symptoms.—Before describing the chief varieties of insanity, with the main characteristics of each, we must refer to certain early symptoms, and also to some general symptoms which commonly accompany the insane state.

(*a*) Early Symptoms.—Insanity rarely develops quite suddenly, and indications of an approaching mental breakdown may

be gathered from some early premonitory symptoms, although these may be of so slight a character as to escape observation, or if observed, to be considered as of no serious moment. Perhaps the most important is *alteration of disposition,* and this change may be either an exaggeration of the usual state of mind of the individual, or may be in a direction diametrically opposed to it. *Alterations of habit and conduct* also may be observed: a miser may become a spendthrift; a cool, calculating business man begins to indulge in foolish speculations; a hitherto temperate, upright man may give way to debauchery and depravity. These early alterations of habit and conduct are frequently associated also with various *physical symptoms,* such as pains in the head, sleeplessness, disorders of digestion and loss of weight, these all pointing to disturbed and perverted physical health.

(*b*) General Symptoms of insanity fall under two divisions: (1) *Insane beliefs.* (2) *Insane acts.*

(1) *Insane beliefs* may be either of the nature of delusions or of hallucinations.

A *delusion* may be defined as "a belief in a fact which, to a sane person of similar education, age, and race, appears certainly false, and of the falsity of which the person laboring under insane delusions cannot be persuaded either by his own senses or by the arguments of others." The presence of delusions is a strong proof of insanity, and in the investigation of any mental state special care must always be taken to find out their existence —a task which is often very difficult, as they may be carefully and skilfully concealed. They may be classified as follows. *Delusions of grandeur* accompanying states of mental exaltation. A poor man thinks he is possessed of millions of money; another is the king of the universe, and can summon and hold converse at any time with the prophets of both the Old and the New Testament. *Delusions of unseen agency* lead their victims to imagine that they are electrified by batteries; disturbed at night by persons who attempt to mutilate or ravish them; or that, inside their body, they have a person or animal, and that all the food they take goes to nourish the intruder. *Delusions of suspicion and persecution* cause the persecutions to be attributed to actual known persons; the annoyance is not caused by something intangible and unknown, but certain persons, who can be named by the insane person, are supposed to have poisoned his

food, to call him bad names, or to follow him about and annoy him.

Hallucinations are false perceptions of the senses, those of hearing and sight being the most commonly affected. *Hallucinations of hearing* are often found in chronic cases of insanity, and when the illness is insidious, free from acute symptoms, and slowly progressive, they frequently constitute very early symptoms. Patients complain that they hear voices speaking to them. These voices may be well known to them or unknown, may be in the same room in some corner or cupboard, or outside in the open air; they may rule their lives, compel them to eat or abstain from food, urge them to destroy themselves or to commit murder. These patients, therefore, are looked upon as dangerous both to themselves and to others. *Hallucinations of sight* are common in acute excitement, and always accompany, for example, acute alcoholism; the things that are seen may be animals, such as bats, mice, rats, or snakes; or there may be bright flashes of light, during which imaginary people are seen. *Hallucinations of smell and taste,* especially the latter, are uncommon, and merely require passing mention.

(2) *Insane acts* include suicide, homicide, and various other hurtful or bizarre forms of conduct.

Suicide is probably the most extreme of all insane acts, as it violates one of the strongest of human instincts, namely, self-preservation. It may be the result of profound mental depression, it may be prompted by delusions of persecution, or by hallucinations of hearing, the sound of voices, for example, urging to self-destruction. It may accompany an acute illness, or may be the one outstanding feature of the illness, a true suicidal impulse. The idea is sometimes quite a sudden one, an attempt at self-destruction being made, and the patient being afterward totally unable to account for it, or, on the other hand, the wish may have long been harbored and the details of the attempted suicide carefully planned.

Homicide, again, like suicide, may be the outcome of delusions, specially those of persecution and suspicion; or the act may be committed while the patient is under the influence of hallucinations. A genuine homicidal act is frequently committed by patients suffering from both delusions and hallucinations. A man believes, for example, that he is being persistently slandered

and persecuted; he hears voices urging him to murder his persecutors, and he murders them, either suddenly under the influence of a genuine homicidal impulse, or deliberately after having carefully laid his plans.

Other insane acts, not leading to such momentous issues, may be shortly mentioned, such as constant tearing of clothes, fantastic and extravagant dressing, refusal of food, kleptomania, dipsomania, indecent exposure of the person, and the commission of revolting, unnatural sexual offenses.

Varieties of Insanity.—MANIA.—The characteristic of this form of insanity is mental exaltation. The brain is in a state of overactivity, which may affect only the intellectual part of the cerebral mechanism, or involve also the motor parts. In the former, the mania is *subacute* or *simple,* and is characterized by great loquacity, garrulousness, and clever repartee. Likes and dislikes of an extreme degree are common; there is no stability of idea, conduct, or emotion, and as the insanity is not of a very deep degree, such patients are troublesome to treat, and are a source of constant annoyance to those around them. If the disturbance goes farther, however, and affects the motor functions as well, then we get the condition of *acute mania.* Here there is great loquacity, but absolute incoherence of speech, intense muscular restlessness, complete disappearance of will-power; the person may, in short, be termed *raving mad.* It is impossible for such patients to fix the attention on any one subject; they seem for long insensible of any fatigue, either of body or mind, and this excitement may continue for several days and nights, until complete exhaustion supervenes. There are also well marked physical symptoms, such as disordered digestion, altered secretions, and loss of weight. As to termination, a few of the cases of mania die as the result of sheer exhaustion or some physical complication; the majority recover, either abruptly or gradually after relapses; a few end in dementia, and a certain number pass into *chronic mania,* in which condition all the symptoms continue, but on a quieter and lower level. In all chronic maniacs, however, there is a tendency to times of great excitement, these being followed by periods of quiet.

MELANCHOLIA.—The characteristic mental symptom in this variety is depression; there is a great sense of ill-being, and all impressions are of a painful nature. Several forms are described.

Simple melancholia is common, and may never need asylum treatment at all. The depression is not very great, and the will-power is so far from being completely in abeyance that a person suffering from this malady may pull himself together in the presence of strangers, and only intimate friends may know of the sense of ill-being, the disinclination to work, the lassitude, the desire to be alone, and the painful introspection of such individuals. The reasoning power is still present, though perverted; all failings of character are magnified into vices, and are looked upon as the cause of the malady. In *acute melancholia* the will-power is gone, the mental pain is greater, and there is no control over thought or action. There may be great excitement also—wringing of the hands, swaying of the body, delusions of culpability. Patients think they have ruined themselves and their family, that they will be burned, tortured or murdered, and in them the impulse to suicide may be very strong. Physical symptoms here, also, are very marked, the most constant being the greatly disordered digestion. Recovery is frequent, but may be protracted; while some cases end in chronic melancholia with fixed delusions, others pass into dementia.

Chronic Delusional Insanity is characterized by a very chronic course, and by the presence of systematized delusions and hallucinations. It may follow an attack of acute mania or acute melancholia, it is a common form of insanity as the result of alcoholism, but it may be a developmental insanity, in which there have been no acute attacks of excitement, and may thus be only the gradual outcome of a character naturally unstable. The prognosis is always grave; there is a marked tendency to dementia, or, at least, considerable mental enfeeblement, though there is occasionally unexpected recovery after many years' illness.

States of Mental Enfeeblement.—*Primary enfeeblement,* the result of arrested brain development, either before birth or in very early childhood, is seen in *idiocy* and *imbecility,* the latter showing less mental enfeeblement than the former.

The following are the chief forms of idiocy:

(*a*) *Genetous,* the variety that begins before birth, and to this class the large majority of idiots belong.

(*b*) *Epileptic,* in which, in addition to the idiocy, there are recurring epileptic fits.

(*c*) *Paralytic,* with a greater or less degree of loss of muscular power, resulting from an apoplectic attack in early infancy, or from severe injury to the head in the act of birth.

(*d*) *Hydrocephalic,* characterized by enlargement and deformity of the head.

(*e*) *Microcephalic,* in which there is great diminution in the size of the head.

In all the varieties the mental enfeeblement varies greatly in degree, as some idiots and imbeciles can be taught to earn a livelihood by sending them to special training-schools and institutions, whereas others are quite incapable of education. There is also frequently accompanying the mental feebleness some inherent bodily weakness, many, when comparatively young, falling victims to tubercular disease in some of its forms.

Dementia is most often secondary to acute mental disease, and it is always the end of insanities that are not recovered from. It varies in degree, but when it is complete the patient lives a vegetable existence, is unable to converse or work with any willpower, and is frequently of dirty habits. The physical health is usually unimpaired, though recovery, of course, is hopeless.

General Paralysis or Paralytic Dementia is a disease of middle life, occurring most commonly in men, and due in the great majority of cases to a previous syphilitic infection. Death occurs usually in three years from the commencement of the illness. The patient may die in the earlier stages from congestive seizures, which produce convulsions with a loss of consciousness, or the fatal termination may become "remitted," that is, the illness may become for a time stationary.

Epileptic Insanity.—Epilepsy may exist in every form without such mental symptoms as would constitute insanity. But the mental health, after long-continued epilepsy, whether the fits be slight or severe, is almost always enfeebled, and, especially in the young, symptoms constituting insanity sometimes appear. The most marked characteristics are intense irritabilty and impulsiveness. Attacks of acute maniacal excitement are common, and many cases are most dangerously homicidal. Usually before an insane epileptic is going to have fits, he becomes more than usually irritable, suspicious, and impulsive. The dangerous impulsiveness may occur also in a state of semiconsciousness just after the fits have passed off, and sometimes the impulsive

act seems actually to take the place of a fit, constituting what is known as masked epilepsy.

Treatment of Insanity.—(*a*) PREVENTION.—The question of the prevention of insanity entails two considerations: first, the counteraction of the various evil influences which impair the mental health of the social body generally; and second, the recognition of certain broad definite lines of living which should be followed by anyone who, on account of hereditary predisposition, is liable to become insane.

Intemperance, besides being the cause of great misery and many crimes, is also responsible for the production of a very large proportion of all cases of actual insanity. Every effort should be made to encourage a healthy mode of living, to insist on the importance of good nourishing food, and to provide an education which shall be broad and liberal, and at the same time one that disciplines the mind in habits of self-control and self-denial. To those, however, in whom there is a strong hereditary tendency to insanity, life frequently resolves itself into a "continual struggle to oppose the bent of their being." Has such a person any power over himself to prevent his becoming insane? That he is to a certain extent responsible for the preservation of his sanity there can be no doubt, and in connection with this the first truth for him to grasp is that his life must be lived under constant obedience to certain definite rules. He must first accept his heredity as an indisputable fact, one which cannot be passed over; and then, having faced it, the knowledge of it must be turned into a defense. For example, if his father or mother, or more especially if both, have been addicted to intemperance, he should resolutely make up his mind never to touch alcohol. No half-measures are of any avail; he must become a total abstainer, for an amount of alcohol which to another might be quite innocuous is to him harmful in the highest degree. The person of bad heredity should be contented with a life lived on a humble level. His ambitions must be flung aside and his gifts turned into the channel of a life which may be uneventful, but at all events free from excitement and mental strain. By constantly living under the influence of an inner unseen self-discipline, he must strive to keep his own complete self-respect: those passions which spring from strong self-feeling must be rigorously subdued; the emotions must be moderated and controlled; his aim

should be, in short, the formation of a character which shall be obedient to the dictates of a well fashioned will.

(*b*) CURE.—Passing to the actual treatment of insanity, we recognize that, as the outcome of a more rational view of mental disease, the insane are now regarded and treated as sick persons, and looked upon as suffering from an actual brain disease which presents certain definite symptoms, just as other diseases do. The old methods of treatment, by punishment, solitary confinement, manacles and strait-jackets, have now disappeared forever. Recently there have been instituted for the treatment of the insane, wards attached to the large general hospitals, and thereby the stigma of certification as a lunatic is avoided. More especially is this method of value in those illnesses which are likely to prove of short duration or of a mild character.

Home treatment is often, however, impossible, more especially if it becomes clear that the illness is going to be a protracted or violent one, if it is aggravated by home associations and surroundings, or if it is characterized by intense suicidal or homicidal tendencies. In that case, the patient must be duly certified and placed under asylum discipline and control.

The actual treatment of insane individuals may be divided into moral and medical.

By *moral treatment* is meant that personal influence which the sane exercise over the insane. In the exercising of this influence there must be constant kindness and perfect firmness. The patient, whenever suitable, is given some liberty, he is allowed out on parole, he can visit places of amusement, he is encouraged to take exercise and recreation, and, above all, he is encouraged to work. When a man is emerging from acute melancholia, he works in the grounds and digs in the garden; a woman works in the kitchen or sews in the sewing-room. To enable this treatment to be properly carried out, the coöperation of good attendants and nurses is essential, and every effort is now made to have them in sufficient numbers and to encourage them in their work by good remuneration, lectures on the nursing and treatment of the insane sick, and the granting of certificates of proficiency after examination.

The medical treatment.—The importance of absolute physical rest in the early and acute stages of the illness is becoming more and more recognized. At one time maniacal patients, for ex-

ample, were encouraged to walk about until exhausted, to get rid of what was supposed to be superfluous nerve energy; this view has largely been abandoned, and rest in bed is employed in order to conserve as much energy as possible. Good, plentiful food, of an easily assimilable kind, such as eggs and milk, is essential, and in those who refuse food, forcible feeding through a tube passed into the stomach is employed. The control of excitement and sleeplessness by various drugs, baths, etc., is highly important. Finally, toning up the system and improving the blood by suitable digestive and blood tonics is very often necessary.

MENINGITIS

Definition.—Meningitis is a term applied to inflammation affecting the membranes of the brain (cerebral meningitis) or spinal cord (spinal meningitis) or both.

Cerebral meningitis presents two varieties, simple and tubercular.

SIMPLE MENINGITIS

Causes.—Among the more common are injuries of the head, extension of disease from contiguous parts, such as erysipelas of the scalp or caries of the bones of the ear, exposure to cold or to extreme heat, and the presence of tumors in the substance of the brain. It may likewise occur in the course of fevers, rheumatism, and inflammatory affections, and also as a result of mental overwork, sleeplessness, and alcoholic excess and syphilitic disease. This variety of meningitis is less common than tubercular meningitis, but it is on the whole more amenable to treatment.

Symptoms.—The symptoms present such a general resemblance to those of tubercular meningitis that it is unnecessary to refer to them in detail, and the treatment is essentially the same for both.

TUBERCULAR MENINGITIS

Definition.—Tubercular meningitis, or acute hydrocephalus, is an inflammation of the membranes caused by the tubercle bacillus. The disease is most common in children under the age of ten years, but is by no means confined to that period of life, and may affect adults.

Causes.—The scrofulous or tubercular constitution is an important factor in the disease, which is one of strongly hereditary tendency, several children in one family frequently dying of the malady at intervals of, it may be, many years. In numerous cases it is manifestly connected with bad hygienic conditions, with insufficient or improper feeding, or is a consequence of some disease of childhood, particularly measles or whooping-cough.

Symptoms.—Tubercular meningitis is usually described as passing through three stages; but it must be observed, as regards at least its earlier manifestations, that, so far from being well defined, they are often exceedingly vague, and render this disease in an especial manner liable to escape detection for a length of time, or to be confounded with others to which at its commencement it bears an acknowledged resemblance, such, for instance, as typhoid fever or gastro-intestinal derangements. Nevertheless, there are certain typical features characterizing the disease in each of its stages which it is important to describe, as in many instances these present themselves with greater or less distinctness.

The *premonitory symptoms* of tubercular meningitis are mostly such as relate to the general nutrition. A falling off in flesh and failure of strength are often observed for a considerable time before the characteristic phenomena of the disease appear. The patient, if a child, becomes listless and easily fatigued, loses appetite, and is restless at night. There is headache after exertion, and the temper often undergoes a marked change, the child becoming unusually peevish and irritable. These symptoms may persist during many weeks; but, on the other hand, such premonitory indications may be entirely lacking, and the disease be developed to all appearance quite suddenly.

The onset of the *first stage,* or *stage of excitement,* is in most instances marked by the occurrence of vomiting, often severe, but sometimes only slight, and there is, in general, obstinate constipation. In not a few cases the first symptoms are convulsions, which, however, may in this early stage subside, and remain absent, or reappear at a later period. Headache is one of the most constant of the earlier symptoms, and is generally intense and accompanied with sharper paroxysms, which cause the patient to scream, with a peculiar and characteristic cry. There is great intolerance of light and sound, and general ner-

vous sensitiveness. Fever is present to a greater or less extent, the temperature ranging from 100° to 103° F.; yet the pulse is not quickened in proportion, being on the contrary rather slow, but exhibiting a tendency to irregularity, and liable to become rapid on slight exertion. This slowness of the pulse is of great importance in distinguishing the disease from others which resemble it, and in which the heart beats more rapidly in proportion to the temperature. The breathing, too, is somewhat irregular. Symptoms of this character, constituting the stage of excitement, continue for a period varying from one to two weeks, when they are succeeded by the stage of depression.

In the *second stage,* or *stage of depression,* there is a marked change in the symptoms, which is apt to lead to the belief that a favorable turn has taken place. The patient becomes quieter and inclines to sleep, but it will be found on careful watching that this quietness is but a condition of apathy or partial stupor into which the child has sunk. The vomiting has now ceased, and there is less fever; the pulse is slower, and shows a still greater tendency to irregularity than before, while the breathing is of markedly unequal character, being rapid and shallow at one time, and long drawn out and sinking away at another. There is manifestly little suffering, although the peculiar cry may still be uttered, and the patient lies prostrate, occasionally rolling the head uneasily upon the pillow, or picking at the bedclothes or at his face with his fingers. He does not ask for food, but readily swallows what is offered. The countenance is pale, but is apt to flush up suddenly for a time. The eyes present important alterations, the pupils being dilated or unequal, and scarcely responding to light. There may be double vision, or partial or complete blindness. Squinting is common in this stage, and there may also be drooping of an eyelid, due to paralysis of the part, and one or more limbs may be likewise paralyzed.

To this succeeds the *third,* or *final stage,* in which certain of the former symptoms recur, while others become intensified. There is generally a return of the fever, the temperature rising sometimes to a very high degree. The pulse becomes feeble, rapid, and exceedingly irregular, as is also the case with the breathing. Coma is profound, but the patient may still be got to swallow nourishment, though not so readily as before. Convulsions are apt to occur, while paralysis, more or less extensive,

affects portions of the body or groups of muscles. The pupils are now widely dilated, and there is generally complete blindness and often deafness. In this condition the sufferer's strength undergoes rapid decline, and the body becomes markedly emaciated. Death takes place suddenly in a fit, or, more generally, from exhaustion. Shortly before the fatal event it is not uncommon for the patient, who, it may be, for some days previously lay in a state of profound stupor, to wake up, ask for food, and talk to those around. But the hopes which may be thus raised are quickly dispelled by the setting in of the symptoms of rapid sinking.

Treatment.—With respect to treatment, little can be stated of an encouraging nature. Still, it must be observed that much may be done in the way of prevention of this disease, and, in its earlier stages, even in the way of cure. It is most important in families where the history indicates a tubercular or scrofulous tendency, and particularly where meningitis has already occurred, that every effort should be used to fortify the system and avoid the causes that favor the development of the disease during early childhood. With this view, wholesome food, warm clothing, cleanliness, regularity, and the avoidance of overexertion, physical and mental, are of the utmost consequence, and care should be taken to avoid tuberculous milk.

Although there is but little that can be done when the disease has set in, yet the timely use of remedies may mitigate and even occasionally remove the symptoms. The severe headaches may often be relieved by the application of one or two leeches to the temples, and by the frequent use of cold water or ice applied to that part of the head indicated by the shaded area in the accompanying illustration. On the whole, the maintenance of the patient's strength by light nourishment and the use of sedatives to compose the nervous system are the measures most likely to be attended with success. The bromide, with which may be combined the iodide of potassium, is the medicinal agent of most value for this purpose. Should con-

vulsions occur, they are best treated by chloral or chloroform. The slight operation known as lumbar puncture is of value both as an aid to diagnosis and in quieting or preventing convulsions by withdrawing some of the overabundant fluid surrounding the central nervous system.

SPINAL MENINGITIS

Definition.—Spinal meningitis, or inflammation of the membranes investing the spinal cord, generally results from causes of a similar kind to those producing cerebral meningitis,—injuries, exposure to cold or sudden changes of temperature, diseases affecting adjacent parts, such as the vertebral column or the spinal cord itself, or extension downward of inflammation of the membranes of the brain. It is said to be most common in males. As in the case of the brain, the membranes become extremely congested; exudation of fibrine and effusion of serum follow, and the spinal cord and roots of the nerves become more or less involved in the morbid process.

Symptoms.—The chief symptoms are fever, and severe pain in the back or loins shooting downward into the limbs (which are the seat of frequent painful involuntary startings), accompanied with a feeling of tightness round the body. The local symptoms bear reference to the portion of the cord the membranes of which are involved. Thus, when the inflammation is located in the cervical portion the muscles of the arms and chest are spasmodically contracted, and there may be difficulty of swallowing or breathing, or embarrassed heart's action; while, when the disease is seated in the lower portion, the lower limbs and the bladder and rectum are the parts affected in this way. At first there is excited sensibility and great pain in the parts of the surface of the body in relation with the portion of cord affected. As the disease advances these symptoms give place to those of partial loss of power in the affected muscles, and also partial anesthesia. These various phenomena may entirely pass away, and the patient after some weeks or months recover; or, on the other hand, they may increase, and end in permanent paralysis.

Treatment.—The treatment is directed to allaying the pain and inflammatory action by opiates. Ergot of rye is strongly

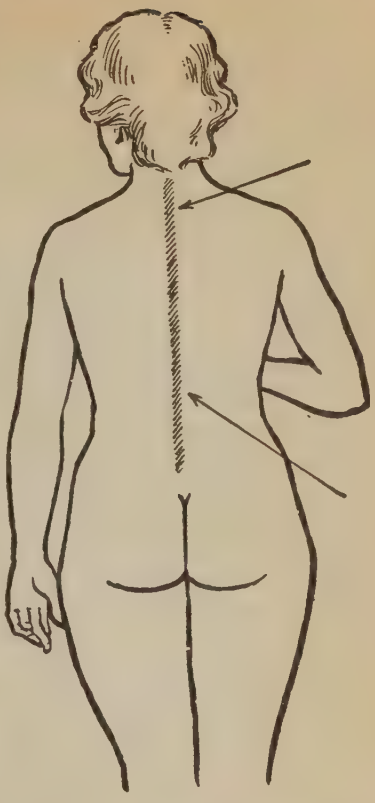
recommended by many physicians. The patient should have perfect rest in the recumbent, or better still in the prone, position. Cold applications to the spine may be of use, while scrupulous attention to the functions of the bladder and bowels, and to the condition of the skin with the view of preventing bedsores, is all-important.

CEREBRO-SPINAL MENINGITIS

Definition.—This name, as well as the names cerebro-spinal fever, spotted fever, and the black sickness, is applied to a malignant epidemic fever, attended by painful contractions of the muscles of the neck and retraction of the head. This disease appears to have been first distinctly recognized in the year 1837, when it prevailed as an epidemic in the southwest of France, chiefly among troops in garrison. For several years subsequently it existed in various other localities in France, and mostly among soldiers. At the same time in other countries in western and central Europe the disease was observed in epidemic outbreaks, both among civil and military populations. In more recent times the disease has repeatedly appeared both in America and Europe, but it has seldom prevailed extensively in any one tract of country, the outbreaks affecting for the most part limited communities, such as seaports, garrisons, schools, and prisons.

Causes.—The direct cause appears usually to be the *Diplococcus intracellularis* of Weichselbaum, which is found in the exudation round the nervous system, in the blood during life, and in the nasal discharges. Other cases with similar symptoms are due to the pneumococcus or other bacteria. It is believed that infection is frequently carried by the nasal discharges of persons who do not themselves contract the disease.

Symptoms.—The following are the more prominent symptoms. After a few days of general discomfort, the attack comes on sharply with rigors, intense headache, giddiness, and vomiting. Neuralgic pains in the abdomen, and pain with spasmodic contractions in the muscles of the extremities, occur at an early stage. The headache continues with great severity, and restlessness and delirium supervene, accompanied with periods of somnolence. The pain is usually very severe at the points indicated



by the arrows in the accompanying illustration. The patient's head is drawn backward and rigidly fixed, the spine arched, and the arms and legs powerfully flexed, the whole condition bearing a considerable resemblance to tetanus. For a time there is greatly increased sensibility of the skin, pain being excited by the slightest contact. There is more or less fever present. About the fourth day of the disease an eruption on the skin both of the face and body frequently appears, in the form either of purpuric spots or small clear vesicles. Death may take place in from a few hours to eight or ten days. Should the patient survive the immediate shock of the attack, serious complications are apt to appear in the form of destructive inflammation of the eyes or ears, inflammation with effusion into certain joints, and paralysis of limbs; or, again, recovery may take place after a prolonged convalescence. The mortality appears to vary in different epidemics, in some being as high as eighty per cent., in others only about twenty per cent. Certain forms of the disease are of malignant character from the first, and very rapidly fatal.

Treatment is as in other forms of meningitis; washing out the spinal canal with warm normal salt solution by punctures above and below has been recommended; Flexner also has introduced a serum, the use of which is associated with a low mortality.

The following prescription is recommended:

℞ Fluidextract of Ergot.....one ounce
Dose: One teaspoonful in a little ice-water, every four hours.

Ice-bags applied to the head and leeches behind the ears will be found beneficial.

MYELITIS—INFLAMMATION OF THE SPINAL CORD

Definition.—This disease, by inflammation, induces destructive changes in the spinal cord. In the *acute* variety the nerve elements in the affected part become disintegrated and softened, but repair may take place; in the *chronic* form the change is slower, and the diseased area tends to become denser (sclerosed), the nerve-substance being replaced by connective tissue. In the variety known as poliomyelitis nerve-cells in the gray matter of the cord become destroyed, and the condition known as infantile paralysis is produced.

Causes.—The chief causes of myelitis are injuries or diseases affecting the spinal column, extension of inflammation from the membranes of the cord to its substance, exposure to cold and damp, and occasionally some preëxisting constitutional morbid condition, such as fever. Any debilitating cause or excess in mode of life will act powerfully in predisposing to this malady. The chronic form is most common in adults, while poliomyelitis, affecting the anterior horn of gray matter in the cord, is almost exclusively limited to young children.

Symptoms.—Myelitis may affect any portion of the spinal cord, and its symptoms and progress depend not only upon the extent of cord involved, but upon the particular nerve-paths which happen to be implicated. Its most frequent site is in the lower part, and its existence there is marked by the sudden or gradual occurrence of weakness of motor power in the legs (which tends to pass into complete paralysis), impairment or loss of sensibility in the parts implicated, nutritive changes affecting the skin and giving rise to bed-sores, together with bladder and bowel derangements. There is, in addition, if the disease affects the cord at a level above that from which the nerves of the lower limbs originate, a spastic or jerky condition, in which, owing to the control of the higher centers in the brain being cut off, involuntary contractions of the muscles and movements of these limbs take place. In the acute form, in which there is at first pain in the region of the spine and much constitutional disturbance, death may take place rapidly from extension of the disease to those portions of the cord connected with the muscles of respiration and the heart, from an acute bed-sore which is very

apt to form, or from some intercurrent disease. Recovery to a certain extent may, however, take place; or, again, the disease may pass into the chronic form. In the latter, the progress is usually slow, the general health remaining tolerably good for a time, but gradually the strength fails, the patient becomes more helpless, and ultimately sinks exhausted, or is cut off by some complication.

Treatment.—The treatment for myelitis in its acute stage is similar to that for spinal meningitis. When the disease is chronic, the most that can be hoped for is the relief of symptoms by careful nursing and attention to the condition of the body and its functions. Benefit is sometimes derived from the employment of electricity, and the use of baths and douches to the spine. Above all, careful and regular attention to the functions of the bladder and bowels, and attention to the skin of the back, upon which bed-sores are extremely liable to form, is essential.

The following prescription will be found valuable:

℞ Urotropine .....five-grain tablets
Dose: One tablet every four hours thoroughly dissolved in water.

DISSEMINATED SCLEROSIS

Definition.—Disseminated sclerosis, also called multiple and insular sclerosis, is a disease of the brain and spinal cord, which, though slow in its onset, produces marked symptoms, such as paralysis and tremors, and leads to death, as a rule, in five or ten years. It consists of hardened patches, from the size of a pinhead to that of a pea or larger, scattered here and there irregularly through the brain and cord, each patch being made up of a mass of the connective tissue (neuroglia), which should be present only in sufficient amount to bind the nerve-cells and fibers together. This connective tissue, being increased, presses on and destroys first of all the insulating sheaths which surround the nerve fibers, later the fibers themselves.

Causes.—These are very obscure, for the disease comes on in young people, being rare after the age of forty, apparently without previous illness, and though it occurs sometimes in persons with a heredity of nervous disorder, this is not always so. Exposure to wet and cold, mental shock, great exhaustion, and a

severe attack of a disease like typhoid fever, scarlatina, or influenza, have been assigned as causes.

Symptoms.—These depend greatly upon the part of the brain and cord affected by the sclerotic patches. Very often the disease is preceded by some hysterical manifestations, and may show no other sign for several years. Not infrequently great injustice and lack of sympathy are exercised toward a person whose trouble commences in this way and later develops into multiple sclerosis. Temporary paralysis of a limb or of an eye-muscle, causing double vision, and tremors upon exertion, first in the affected parts, and later in all parts of the body, are early symptoms. Great activity is shown in the reflex movements obtained by striking the tendons and by stroking the soles of the feet, an important sign in the latter case being that the toes bend up instead of down, as in health. Trembling handwriting, interference with the functions of the bladder, giddiness, a peculiar staccato or scanning speech, and various peculiarities of sensation—numbness, prickly feelings, hot flushes—are common symptoms at a later stage. As the disease progresses, these become marked, epileptiform fits may appear, mental dullness or more serious insanity sometimes comes on, and the paralyses, which before were transitory, now become confirmed, often with great rigidity in the limbs. Bed-sores sometimes form late in the course of the disease.

Treatment is unsatisfactory, because the most that can be done is by means of careful dieting, tonics, plenty of sleep, and especially by leading a life as free from strain as possible, to check the progress rather than to effect a cure of the disease.

The following tonic is recommended:

℞ Elixir of Iron, Quinine, and Strychnine .....three ounces

Dose: One teaspoonful in a wineglass of water, half an hour after meals.

WASTING PALSY—PROGRESSIVE MUSCULAR ATROPHY

Definition.—This is a disease characterized by the wasting of certain muscles or groups of muscles, accompanied with a corresponding weakness or paralysis of the affected parts, and it is believed to depend on a slow inflammatory change in the

anterior horns of the gray matter of the spinal cord. It usually occurs in middle life.

Symptoms.—It is insidious in its onset, and usually first shows itself in the prominent muscular masses in the palm of the hand, especially the ball of the thumb, which becomes wasted and deficient in power. The other palmar muscles suffer in like manner, and as the disease advances, the muscles of the arm, shoulders, and trunk become implicated if they have not themselves been the first to be attacked. The malady tends to spread symmetrically, involving the corresponding parts of the opposite side of the body in succession. It is slow in its progress, but, notwithstanding it may occasionally undergo arrest, it tends to advance and involve more and more of the muscles of the body until the sufferer is reduced to a condition of extreme helplessness. Should some other ailment not be the cause of death, the fatal result may be due to the disease extending so as to involve the muscles of respiration.

Treatment.—The following tonic and prescription have been found of value in the treatment of this disease:

℞ Elixir of Iron, Quinine, and Strychnine Phosphates ..... four ounces

Dose: One teaspoonful three times a day, before meals.

Or:

℞ Tincture of Cayenne Pepper..... two drams
Tincture of Calumba ..... two drams
Tincture of Nux Vomica..... two drams
Ammoniated Tincture of Valerian... four drams
Tincture of Lavender Compound, to make ..... three ounces

Mix.

Dose: Two teaspoonfuls three times a day, before meals.

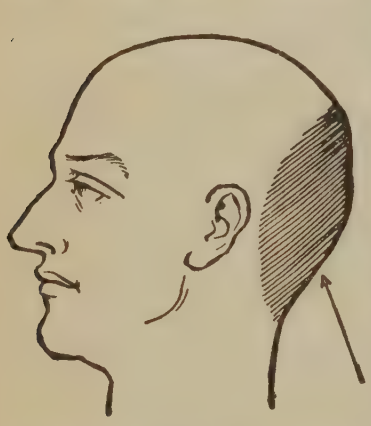
NEURASTHENIA

Definition.—Neurasthenia means a condition of nervous exhaustion in which, although the patient suffers from no definite disease, he becomes incapable of sustained exertion. The condition is closely allied to several unusual mental states, such as hypochondriasis and hysteria, and there is no sharp line between

neurasthenia and hysteria, intermediate cases of every grade being met with.

Causes.—The condition comes on much more readily in some persons than in others, and people who in middle life suffer from neurasthenia have often shown other nervous manifestations in youth. It must not be supposed that persons who suffer from neurasthenia do so because they have worn out the store of nerve-force with which they started life; but just as in commercial life persons with a small capital must be content to do a moderate business, so the nervous organization of some people is capable of producing nerve-energy only at a slow rate, and such persons must avoid the full strain and competition of life.

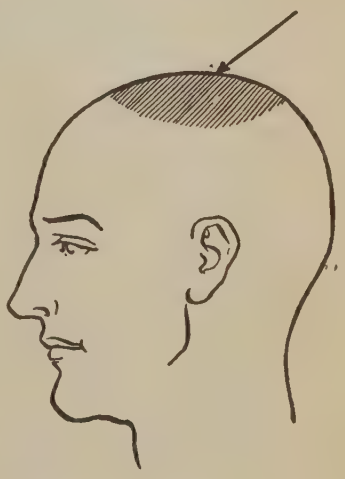
Symptoms.—The most prominent and constant symptom is that of weakness and weariness on exertion. The person may feel fresh enough in the early part of the day, but after very slight effort he becomes exhausted, and trembles. The appearance changes, the person becoming puffy under the eyes, sallow and bloodless. Generally, the neurasthenic person becomes painfully thin as well as weak, but in some cases the change is toward a fat, flabby habit of body. There is usually severe pain in the back of the head, as shown by the shaded area in the accompanying illustration. A condition of irritable weakness develops throughout the body, in the heart, stomach, bowels and other organs, so that the person suffers from palpitation, loss of appetite, with dyspepsia after taking the simplest food, and griping pains in the abdomen, generally associated with obstinate constipation. Though in the early stages the person may be overcome with sleep when tired, sleeplessness is a wearisome symptom later on. The temper changes also, the sufferer becoming, as a rule, intensely irritable and emotional.



Treatment.—In early and slight cases, a complete rest, with the cessation of all business and intellectual work, is often sufficient in a month or two to bring about a cure. The person should always leave home for a new environment, and, generally speaking, the cares and associations of daily life should be cut off by

a complete severance for a time from relatives and friends. An attempt should be made to stimulate the appetite by tonics, fresh air, etc., and the amount of exercise must be proportional to the food taken, growing more vigorous as the appetite improves. The treatment of constipation and sleeplessness is also of great importance.

In those cases where thinness and loss of appetite are marked features, so that physical effort becomes a great burden, the form of feeding known as Weir Mitchell treatment is often advantageous. Briefly put, this consists of: (*a*) complete rest in bed with entire absence of physical and mental effort; (*b*) feeding, which begins with small quantities of milk, and is gradually increased as the digestion will stand it, till the patient takes three full meals of highly concentrated food every day; and (*c*) regular massage, by an attendant, which takes the place of exercise in causing muscular waste and thereby permitting of the digestion and assimilation of food, but is unaccompanied by any discharge of nervous energy. This treatment is continued for one or two months, and is often attended by surprising benefit. Electrical applications, particularly of the static form and of the high-frequency currents, are often recommended, and are useful as an aid to other treatment. Ice-bags may be applied to that part of the head indicated by the shaded area in the accompanying illustration. After the course of treatment is over, a change of scene or a long sea-voyage is necessary before the person takes up the ordinary routine of life.



The following prescription has been found valuable:

℞ Potassium Bromide.....two and one-half drams
Ammonia Bromide.....two and one-half drams
Hoffmann's Anodyne.....one and one-half drams
Aromatic Spirits of Ammonia .....one and one-half drams
Water, to make.....four ounces

Dose: Two teaspoonfuls when necessary.

As a tonic the following should be taken for some time:

℞ Elixir of Iron, Quinine, and Strychnine Phosphate.....four ounces

Dose: One teaspoonful three times a day, before meals.

HYSTERIA

Definition.—Hysteria is a condition or set of conditions which it is difficult to define, because it is not known what changes in the nervous system lie at its root. Hysteria manifests itself by over-action of some parts of the nervous system, or by failure of other parts to perform their necessary work.

Causes.—The condition is far more common in women than in men, appearing generally about the age of fourteen, though it may begin earlier, and usually passing off when full development is reached, though it may persist through life to old age. Heredity is of importance, the disease being far most common in the Latin races, and running to a great extent in families. Defective moral training and want of physical exercise in early youth predispose greatly to hysteria, which in young women of poor physique, unequally developed mind, and pampered habits, may be produced by sudden fright, family worry, grief, or a love-affair.

Symptoms.—*Mental changes* are almost always observable in hysterical cases, though the other symptoms in different cases may differ totally from one another. The affected person becomes whimsical, dominated by ideas, and unable for the same work and concentration as before. She becomes easily excitable, and is either morbidly sensitive, feeling keenly slight rebuffs, or unusually demonstrative, bursting into fits of laughter or paroxysms of weeping upon slight occasion. In marked cases, hysterical subjects become morally unhinged, deceiving every one around them, so that little credence can be given to their statements. In advanced cases, delirium and fever may appear and last for some time, or even insanity may ensue.

Convulsive hysteria is the most marked form. An attack may begin upon some excitement, with laughter or weeping, or may give no warning sign. The person falls in an unconscious or half-conscious condition, but whereas the fall in epilepsy is

downright, the hysterical person subsides gently in general upon a couch or chair, and rarely or never so as to hurt herself. She may then lie still, or more generally moans or talks incoherently, rolls the head from side to side, and tosses the hands and feet about. In serious attacks, known as hystero-epilepsy, the onset resembles epilepsy and may be followed by curious posturing, the sufferer placing herself in attitudes which suggest powerful emotions of fear, ecstasy, or joy. In this state visions are seen, voices heard, and conversations held with imaginary persons. This forms one of the most perverted types of hysteria and one of the least hopeful as regards a cure.

Loss of sensation over some part of the body is one of the commonest symptoms. This loss may affect a limb or may be irregularly distributed in patches, or may affect some special sense organ, causing failure of taste, blindness for all objects to one side of the field of vision, deafness in one ear, etc. Sometimes there is complete loss of the sense of pain, so that pricks, pinches, and other painful stimuli are easily borne without wincing.

Spasms and contractions of muscles form also a very frequent manifestation of hysteria without any other sign save mental dullness. If this contraction exist in the muscles of the body wall, it may, and frequently does, give rise to the idea that the person is the subject of a tumor. Such spasms may also lead to the drawing up of an arm or foot, so that the limb in time becomes permanently deformed. Or when the mind becomes powerfully impressed by some person or idea, the spasm may pass off, and a gradual or sudden recovery will frequently take place.

Paralysis is perhaps the most troublesome symptom of all to overcome. It may extend over one half of the body, and is then very hard to tell from the effects of apoplexy. Most commonly the foot is affected and the person declares herself unable to walk. These cases sometimes last for years unimproved, and then the paralysis may suddenly vanish. Such persons, when the paralysis affects both legs and is accompanied by pain in the back, have again and again been confined for years to bed or couch as cases of spinal disease, only to recover suddenly when some new interest has come into their lives, or force of circumstances has rendered an active life imperative. The muscles of

the larynx are frequently affected, and the person may be deprived of speech for years, till some powerful influence forces her to exert her will and the organ of voice again comes into play.

Changes in internal organs take place in some cases and produce such signs as constant hiccough, barking noises, excessive vomiting, diarrhea, absolute loss of appetite, and profound changes in the circulation.

Joint affections are among the most remarkable changes. A joint, especially the hip or knee, becomes swollen, stiff, and painful, and may remain so for months.

Treatment.—Special care should be taken in the upbringing of children who come of hysterical family, and they should not, on the other hand, be allowed to work too hard at lessons to the neglect of healthy exercise, nor, on the other hand, should they be pampered and allowed to gratify every passing whim. No hysterical young woman should remain unoccupied, but should do some congenial work. Needless to say, all the bodily functions should be maintained in the best possible order. In acute hysterical attacks rest and quiet are all that is necessary. For the minor manifestations of hysteria, the drugs which do most good are valerian and asafetida. For symptoms such as vomiting, joint affections, loss of sensation, and spasms, removal from home and from the attentions of sympathetic friends to strict isolation, where the patient sees nobody but a nurse and eats only the simplest of food, is a good form of treatment. For the severest forms of hysteria, such as loss of appetite, serious paralysis, etc., the Weir Mitchell treatment, as explained in the treatment of neurasthenia, has been most successful. In this method also, isolation and absolute rest in bed are employed. Further, massage takes the place of exercise, and the patient is encouraged to eat large amounts of readily digestible food. Patients upon this system often fatten rapidly, and lose their nervous symptoms. The following remedies are recommended:

℞ Extract of Sumbul .....forty grains
Dried Iron Sulphate .....forty grains
Pulverized Asafetida .....eighty grains
Arsenous Acid .....one grain
Mix and make into forty pills.
Dose: One pill three times a day.

Or:

℞ Fluidextract of Ergot.....four drams
Potassium Bromide.....two drams
Calcium Bromide.....two drams
Camphor-water .....eight ounces
Mix.
Dose: One tablespoonful in water every four hours.

Or:

℞ Tincture of Valerian .....two ounces
Dose: One teaspoonful in sweetened water every three hours.

Or:

℞ Powdered Asafetida.....one-grain capsules
Dose: One capsule after each meal.

Or:

℞ Tincture of Valerian.....one fluid ounce
Tincture of Aromatic Spirits of
Ammonia .....one fluid ounce
Mix.
Dose: One teaspoonful in water every three hours.

DELIRIUM

Definition.—Delirium is a state of perverted consciousness in which an irregular discharge of nervous energy goes on, causing incoherent talk, illusions, and ill regulated muscular action.

Low Delirium is associated with exhaustion, and consists mainly of muttering or rambling talk, in which past events are jumbled together. Surrounding persons and objects are not heeded, or their identity is totally mistaken. The fingers are sometimes busily employed in picking at the bedclothes, or there is a constant twitching of the muscles in the arms, legs, and face, which is a sign of great weakness.

Trembling Delirium (delirium tremens) is the form most commonly due to alcoholism. In this form the mind is more active and illusions more extraordinary. Trembling is a specially marked feature, particularly in the early stages.

Raving Delirium sometimes appears in acute fevers, often is due to alcoholism, and is characterized by violent activity of the

muscular system, acting in response to such wild illusions that it may result in suicide or homicide.

Treatment.—The main object in treatment is to calm the patient's excitement and to induce sleep. An attendant, preferably a male, constantly present, is an essential. A hot bath is an excellent sedative, and should be employed wherever possible. If not, a cold-pack is almost equally efficacious, the patient being wrapped naked in a sheet wrung out of cold water, and then enveloped in several layers of blankets for a quarter of an hour or so. It is marvelous how soon this is followed by deep, sound sleep in most instances. It can be used even when pneumonia is present. Mechanical or forcible restraint should be avoided as much as possible, the patient rather being humored. A female nurse will often accomplish this more satisfactorily than a male attendant, but the latter should not be out of reach, in case of a wild attack. Violent excitement and struggling to get out of bed can be prevented by passing a folded sheet over the chest and fastening it securely under the bed, or, in the very worst cases, by tying the ankles and wrists to the bed. The patient should be fed with strong soups, beef tea, and milk, but given no alcohol. Hypnotic drugs or sleeping-drafts are not infrequently required, but the ordering of these should be left for the doctor, who will be in attendance, and who will also direct what is to be done if such complications as pneumonia or threatened heart-failure occur. In convalescence the patient is often given bitter tonics, and a change of scene to the sea or to the country in the companionship of some steady, reliable friend is very advisable.

℞ Potassium Bromide.....five-grain tablets
Dose: One tablet at night, and repeat in one hour, if necessary.

During convalescence, the following tonic is recommended:

℞ Tincture of Gentian Compound.....three ounces
Dose: One-half teaspoonful in a wineglass of water, twenty minutes before meals.

Sponging the patient with alcohol is also very beneficial.

VERTIGO—GIDDINESS

Definition.—Vertigo, or giddiness, is a condition in which the affected person loses the power of balancing himself, and has a false sensation as to his own movements or as to those of surrounding objects.

Causes.—The simplest cause of vertigo is some mechanical disturbance of the body affecting the fluid in the internal ear; such as that produced by moving in a swing with the eyes shut, the motion of a boat causing seasickness, or a sudden fall. The cause which produces the most severe and most sudden giddiness is Menière's disease, a name under which are grouped the various forms of direct injury to the internal ear. The most serious form is that in which sudden hemorrhage takes place into the semicircular canals, producing an apoplectic-like fall, often of great violence. A condition of similar nature, though less violent and less permanent in its effects, is sometimes produced by the removal of wax from the ear, or even by syringing out the ear. A third group of causes for vertigo is found in disorders of the stomach. Refractive errors in the eyes, which have not received appropriate treatment by glasses, an overstrained nervous system, an attack of migraine, a mild attack of epilepsy, and gross diseases of the brain, such as tumors, form another set of causes acting more directly upon the central nervous system. Finally, giddiness may be due to some disorder of the circulation, such as bloodlessness of the brain produced by fainting, or by disease of the heart, or the congestive state of the brain often found at the climacteric.

Treatment.—While the attack lasts the patient should be kept in a recumbent posture, in a darkened, quiet room. Bromides are the drugs which have perhaps most influence in diminishing giddiness when it is distressing.

℞ Sodium Bromide.....five-grain tablets
Dose: One tablet every two hours until relieved.

A dose of purgative medicine is also of advantage in cases that are more than transient. After the attack is over, careful examination by a doctor is necessary in order to determine the cause, for upon this depends the appropriateness of treatment.

GENERAL PARALYSIS

Definition.—General paralysis is a disease in which both bodily and mental powers degenerate, though in some cases the bodily symptoms are for a time most marked, in others the mental change appears first.

Causes.—Although the direct cause of this disease is still a debated question, several factors are recognized as of great importance in at least predisposing persons to be affected by it. The habitual abuse of alcohol is generally regarded as an important factor. First in importance, perhaps, comes syphilis, and as this is held to be the chief cause of tabes, or locomotor ataxia, which sometimes precedes or occurs along with general paralysis, a direct connection between syphilis and general paralysis is in many cases highly probable. Some authorities attach importance to the use of a too highly nitrogenous diet, while head-injuries, sunstroke, great physical and mental strain, or various excesses, sometimes precede the onset of the disease, though it is doubtful if these do more than hasten its appearance in persons already liable. The disease is extremely rare in childhood or among the aged, being commonest in the prime of life and among men.

Symptoms come on very insidiously, as a rule, and the disease is often far advanced before it is recognized, though, on the other hand, it may now and then be ushered in by convulsive seizures and run a rapid course.

The first stage is characterized by slight physical symptoms, which generally escape the notice of the affected person's friends. These are tremors of the tongue and facial muscles in speaking, transient paralysis of eye-muscles producing slight squint and double vision for a time, stammering over difficult words like "constitution" or "hippopotamus," and, later on, increasing feebleness in walking and disinclination for exertion of all sorts. Furthermore, the handwriting degenerates greatly, and this is often the first symptom that excites remark. All these physical signs are apt to be masked by the peculiar state of mental exaltation which in general ushers in the disease. The person feels himself to be stronger and better than usual, and is never tired of stating that he is "all right," or "as strong as an

elephant," or that he "could jump over a house." But these are delusions, and if he be actually put to the proof, his weakness is discovered. Sometimes the first sign of the malady is a squandering of his money on useless trifles; or foolish and criminal actions may bring the incipient general paralytic into conflict with the law. Great emotionalism is another feature, and the affected person is excited to tears by very little pathos, or to laughter with equal facility. Slight temporary attacks of feverishness also form a very constantly occurring symptom.

In the second stage the physical weakness becomes more and more marked, and in accord with his passiveness, the patient may at first become stout, though he loses this appearance as his digestive powers fail. The sight grows bad, the emotions, from being very facile, become dulled, and the affected person loses his power to feel pleasure or sorrow. Gradually, too, all his senses become blunted, and he loses feeling for actual physical pain, so that he is liable to get bruised and cut. The mind, too, becomes quite clouded, and therefore unfit to sustain the simplest exercise.

In the third stage the mental failure is profound, and the sufferer cannot recognize even his nearest relatives. Speech degenerates to a series of meaningless noises. The paralysis becomes complete, and the person lies oblivious to all around him, and unable even to control his bladder and bowels. In this stage he becomes a ready prey to any infectious disease, and large bed-sores form readily on the devitalized frame. If, by careful nursing, these be prevented, death gradually approaches and takes place from weakness.

The whole course of the disease lasts usually only two to three years, and, though occasional remissions take place, which may prolong life to ten years or more, a genuine case of general paralysis must be regarded as affording little ground for hope.

Treatment.—The first essential in treatment is to remove the person from the chance of indulging in those excesses which are often the cause of, and which certainly aggravate, the malady. The delusions generally render the person unfit to transact business, and even dangerous to his friends. For all these reasons, treatment is best carried out in an institution, where care is taken that the person lives a well regulated life, with sufficient exercise and suitable food. In the later stages, careful and

skilled nursing is indispensable. The following prescriptions may be found beneficial:

℞ Tincture of Aconite..... ten drops
Spirits of Nitrous Ether..... four drams
Liquor Potassium Citrate..... two ounces
Syrup ..... four drams
Mix.
Dose: One teaspoonful every two hours until pulse is soft and compressible. Use where pulse is strong and rapid.

Or:

℞ Potassium Iodide..... four drams
Syrup of Sarsaparilla Compound.... ten ounces
Water, to make..... three ounces
Mix.
Dose: One teaspoonful in water, three or four times a day.

Tonics recommended for this condition are as follows:

℞ Elixir of Iron, Quinine, and Strychnine ..... four ounces
Dose: One teaspoonful in a wineglass of water, half an hour before meals.

Or:

℞ Fowler's Solution..... two teaspoonfuls
Simple Elixir..... six ounces
Mix.
Dose: One teaspoonful in a wineglass of water, half an hour after meals.

DROP-WRIST

Definition.—Drop-wrist is a condition in which, owing to partial or complete paralysis of the muscles which extend to the hand, the latter droops at the wrist.

Causes.—Perhaps the commonest form is that known as crutch-palsy, in which, owing to the constant pressure of a crutch in the armpit, the large nerve that conveys impulses to the extensor muscles of the forearm becomes damaged, and the mus-

cles in question are paralyzed. The same effect is produced not uncommonly when a person sleeps with his head resting on the upper arm. A blow on the back of the arm may produce a similar condition. Certain poisons when present in the system tend to produce inflammation in certain nerves, and of these, lead and alcohol have a special tendency to affect the nerves proceeding to these extensor muscles. The condition may also sometimes be due to chill.

Treatment.—The cases due to pressure on the nerve or to chill require only rest, and perhaps application of massage and electricity to the muscles to prevent their wasting, for recovery takes place in general gradually and surely. In the cases due to lead, the appropriate treatment for lead-poisoning is necessary. Sometimes, when recovery is slow, the injection of small quantities of strychnine into the sheath of the affected nerve may be resorted to.

The following laxative is of value in relieving the trouble:

℞ Magnesium Sulphate.....two ounces
DIRECTIONS: Dissolve in half a pint of water and take in two doses, four or six hours apart.

This prescription has also been recommended:

℞ Potassium Iodide..... two drams
Water, enough to make..... two ounces
Mix.
DOSE: Ten drops, gradually increased to twenty, in plenty of milk, one hour after meals.

NERVE INJURIES

Causes.—Nerve injuries are produced by several causes. Continued or repeated severe pressure may be enough to seriously damage a nerve, as in the case of a badly made crutch pressing into the armpit and causing drop-wrist. Bruising due to a blow, which drives a superficially placed nerve against a bone, may inflict severe damage upon a nerve such as the musculo-spiral nerve behind the upper arm. A wound may sever nerves with other structures, and this accident seems specially liable to occur to the ulnar nerve in front of the wrist, owing to falls upon broken glass, and to various nerves in the armpit when the humerus is

fractured near its upper end. Cold may also damage a nerve severely, as in the case of the facial nerve, when Bell's paralysis results. Or a nerve may be injured at its origin before it leaves the brain or cord, by hemorrhage in the substance of these organs.

Symptoms.—When a sensory nerve is injured, sensation is immediately more or less impaired in the part supplied by the nerve, and, when the nerve in question is a motor one, the muscles governed through it are instantly paralyzed. In the latter case, the muscles gradually waste, and lose their power of contraction in response to electrical applications. Finally, deformities result and the joints become fixed. This is particularly noticeable when the ulnar nerve is injured, the hand and fingers taking up a claw-like position. The skin may also get cold, glossy, and even ulcerate, owing to the loss of its nerve supply.

Treatment.—The nerve, if wounded, should be carefully stitched with the ends touching one another, and, if injured by other causes, should be carefully protected from a repetition of the injury. In some cases recovery takes place within a few days, but usually, if the nerve be completely severed or seriously injured, the muscles supplied by it do not regain their power for several weeks at least. The reason of this is that the part cut off from connection with the brain and cord degenerates rapidly, and the new nerve has to grow all the way down the sheath of the old one. Massage of the muscles will keep them from wasting till the nerve is ready to take up its functions again. The power of the muscles to react again to electric treatment is a most important sign, as showing that repair of the nerve is taking place.

As a tonic for this nervous condition, the following has been found to be valuable:

℞ Strychnine Sulphate ....one-sixtieth-grain tablets
Dose: One tablet half an hour after each meal.

HOME REMEDIES

IF the layman would acquaint himself with the medicinal uses of articles which are to be found in every home, a great deal of worry and unnecessary expense could be avoided. In the following pages, we have endeavored to convey to our readers the general medicinal uses of these articles for various diseases.

Abscess.—If the parts are not congested or ready to open, flaxseed poultices should be applied hourly until the abscess breaks. Then clean the pus away with hot salt water and pour peroxide into the wound; apply a piece of gauze and protect the part from dust.

Acne.—The face should be steamed night and morning and massaged with a Turkish towel. Castile soap should be used to cleanse the skin, and sulphur salve should be applied each night.

Ague.—An infusion of boneset tea given in tablespoonful doses every three hours is valuable. Together with this, ten grains of quinine should be given every four hours.

Alcoholism.—If a teaspoonful of compound tincture of cinchona is taken before each meal, the desire for alcoholics will gradually disappear.

Amenorrhea.—Relief is obtained by taking a hot bath up to the hips. Blaud's pills, taken one after each meal, will often prove beneficial.

Anemia.—The best remedy is to take three drops of Fowler's solution after each meal. Often one-grain doses of quinine taken with the above will hasten a cure.

Angina Pectoris.—Instant relief may be obtained by inhaling the vapor of chloroform. Apply an ice-bag over the painful area.

Apoplexy.—Keep the patient flat on his back. Apply an ice-cap to the head and a hot-water bottle to the feet. Keep the whole body covered with a blanket. A strong cathartic should be given at once.

Appendicitis.—Early in the case, a turpentine stupe should be applied. To prepare this, take a piece of flannel soaked in hot water and put fifteen drops of turpentine on it. Apply this to the patient, as hot as can be borne. If the pain is very severe, an ice-bag should be applied to the abdomen.

Arterial Sclerosis.—There is no direct cure. The bowels should be regulated. No alcoholic liquors should be taken, and the mind should be kept free from worry.

Asthma.—When an attack is coming on, inhalations of chloroform should be given at once. Make a strong solution of saltpeter, saturate pieces of blotting-paper with it, and allow them to dry; when the spasm begins, ignite the paper, allow it to burn, and inhale the smoke. Iodide of potash taken in five-grain doses will often effect a cure.

Backache.—Massage the back with chloroform liniment twice a day. If this does not afford relief, apply hot dry flannels to the painful area.

Barber's Itch.—The entire area should be painted with tincture of iodine; after a few minutes, wash off the iodine with alcohol and apply sulphur salve.

Biliousness.—The bowels should be opened freely, preferably by calomel. Raw fruits, such as lemons and oranges, should be eaten and a cup of hot water taken each morning before breakfast. Any of the following remedies will be found beneficial:

Salt.—One-half teaspoonful of salt added to a cup of hot water and taken half an hour before breakfast, for two or three weeks, is an excellent remedy.

Queen's-root.—Fifteen to twenty drops of the fluidextract of queen's-root taken three times a day, before meals, is highly recommended.

Peppermint.—Thirty drops of essence of peppermint in a teacupful of hot water, taken half an hour before breakfast, has proved very beneficial.

Sal Hepatica.—A dessertspoonful of sal hepatica taken half an hour before breakfast has given good results.

Lemon.—The juice of half a lemon to a teacupful of hot water, half an hour before breakfast for nine days, will give relief.

Bites and Stings.—Apply a saturated solution of washing-soda to the part for several hours. If there is pain, open the point with a needle that has been burned at the tip.

Blackheads.—A teaspoonful of sulphur and molasses should be taken after each meal. Each night apply zinc salve to the face.

Bladder-irritation.—Take half an ounce of pumpkin-seed and boil with half a pint of water. Take one wineglassful every two hours during the day.

Bleeding from Lungs.—Give one teaspoonful of fluidextract of ergot every two hours. Keep the patient quiet and flat on his back.

Bleeding from Nose.—Apply a towel wrung out in ice-water to the whole face; keep the patient quiet and put absorbent cotton in the nostrils.

Bleeding from Skin.—Apply cobwebs, and bandage the parts tightly. If the wound is too deep, apply powdered alum to the cut.

Bleeding from Stomach.—Keep the patient at rest and give a tablespoonful of glycerite of tannin every four hours. If this is not effective, apply an ice-bag to the upper part of the abdomen.

Blisters.—Clean the part with alcohol or peroxide, cover with boric vaseline, and apply light bandage.

Blood-poisoning.—Open the bowels at once with a purgative and give half a teaspoonful of tincture of iron in water every three hours. Fluids should be taken freely and the diet should be nourishing.

Blood-purifier.—Cream of tartar taken in half-teaspoonful doses after meals is valuable. If the bowels need regulation, Rochelle salts should be taken every third morning.

Boils.—Soap and brown sugar made into a paste and applied over the boil will often hasten recovery. Sulphur and cream-of-tartar tablets should be taken for several weeks.

Bright's Disease.—No alcoholic liquors should be taken. The diet should be simple but nourishing. One tablespoonful of Basham's mixture should be taken after meals.

Bronchitis.—*Onions.*—Take three medium sized onions and chop them very fine; sprinkle two tablespoonfuls of sugar over them, then press the juice out. Take a teaspoonful of this fluid every hour or two, or any of the following remedies will be found valuable:

Flaxseed Tea.—Take two teacupfuls of flaxseed tea, two table-

spoonfuls of sugar, and the juice of three lemons, and mix thoroughly. Take two teaspoonfuls every fifteen or twenty minutes.

Lard.—A flannel saturated with hot lard and a few drops of turpentine, applied over the entire chest; repeat when cold.

Ipecac.—Twenty-five drops of tincture of ipecac on loaf sugar dissolved in the mouth every four hours.

The following prescription can be taken with any of the above treatments:

℞ Sweet Spirits of Niter ..... fifteen drops
Tincture of Aconite ..... two teaspoonfuls
Water ..... seven ounces
Mix.
Dose: Two teaspoonfuls in water, every hour or two.

Flaxseed.—Apply flaxseed poultices to the chest several times a day.

Mustard Plaster.—Apply mustard plasters several times a day.

Bruises.—Paint the area with tincture of aconite. If the pain is not relieved, apply a poultice of hot vinegar and bread.

Bunions.—Apply tincture of iodine night and morning. During the day, if a shoe is worn, cover the bunion with adhesive plaster to prevent friction of the shoe.

Burns.—If the burn is mild, apply bicarbonate of soda moistened with water. If the skin is destroyed, pour over linseed-oil and lime-water, equal parts. Vaseline is also an excellent remedy.

Canker of Mouth.—Touch the painful parts with burnt alum. The bowels should be opened freely.

Carbuncle.—Make a bread-and-milk poultice and apply to part. As a tonic, take one teaspoonful of tincture of gentian before each meal.

Catarrh.—*Witch-hazel.*—A solution of witch-hazel and water snuffed up the nostrils three or four times a day is one of the best remedies for nasal catarrh, or any of the following remedies can be relied on:

Milk.—A solution of one teacupful of equal parts of water and milk, with half a teaspoonful of salt added, is an excellent treat-

ment for catarrh, and should be snuffed up the nostrils at least three times a day.

Vinegar.—Two tablespoonfuls of vinegar and half a teaspoonful of salt added to a teacupful of water, injected into the nostrils with an atomizer, several times a day, is a good old remedy.

The use of salt water as a wash for the nose is valuable. During the day the nose should be kept moist with boric vaseline.

Chafing.—Dust the parts with stearate of zinc. Each night wash the parts with pure alcohol or witch-hazel.

Chilblains.—Massage the legs with olive-oil, and apply raw onions to the affected parts night and morning.

Chills and Fever.—Go to bed and keep the body well covered, and take the following remedy made from dried raspberries. To two teacupfuls of water add one tablespoonful of dried raspberries. Let boil for ten or fifteen minutes; strain, and drink as hot as can be borne. It can be sweetened if preferred. Repeat every three or four hours if necessary. In addition to this, quinine in doses of five grains each may be taken every four hours, until three or four doses have been taken.

Choking.—Eating a raw egg will often cause vomiting and give relief, or drinking warm lard.

Cold Feet.—Alternating hot and cold salt-water baths at night will often restore the circulation to its normal tone.

Cold in Head.—Douche the nose with equal parts of bicarbonate of soda and salt. If this is not effective, inhale the fumes from spirits of camphor or aromatic spirits of ammonia.

Colds.—As soon as the onset is felt, the Raspberry Treatment should be given. This is made as follows: Take one tablespoonful of dried raspberries and boil them in two teacupfuls of water; let boil for ten or fifteen minutes; strain, and drink as hot as can be borne. It can be sweetened if preferred. Repeat every three or four hours if necessary. Any of the following remedies will be found beneficial:

Camphor.—Twenty drops of spirits of camphor in a teacupful of hot water and taken every four hours has also been found to be a good remedy for colds.

Cayenne Pepper.—Another effective remedy is Cayenne pepper. To one teaspoonful of Cayenne pepper add a teacupful of boiling hot water. Cover, and let it remain to draw for ten minutes, then strain through a fine cloth. Take one tablespoon-

ful of this fluid to a teacupful of hot water, and repeat every hour or two.

Quinine.—Quinine in five-grain doses, given every two hours until five or six doses have been taken, along with hot drinks of lemonade or milk, is all that is necessary to break up an ordinary cold.

Molasses.—Take one teacupful of molasses, a teaspoonful of butter, and two tablespoonfuls of vinegar; boil on a slow fire for five minutes. Take one teaspoonful when necessary.

Colic.—Give an enema of soap-suds and hot water. Apply flannels wrung out of hot water and sprinkled with ten to fifteen drops of turpentine to the painful area.

Collapse.—Keep the patient flat on his back; loosen the clothing, and give one teaspoonful of aromatic spirits of ammonia in a wineglassful of water.

Constipation.—Eat meals at regular hours. Diet should consist of a small amount of meat, with plenty of vegetables. Drink water freely between meals. A tablespoonful of compound licorice powder taken in half a glass of water at night is very effective. For obstinate constipation, a tablespoonful of mineral oil should be taken each night. If the lower rectum is irritated and causes painful movements, insert a glycerine suppository each night. The juice of half a lemon taken in hot water before breakfast will often promote regular movements.

Convulsions.—Place the patient in a hot-water or mustard bath. Keep cold applications to the head and give inhalations of chloroform until the spasms cease.

Corns.—Soak a small onion in vinegar for six hours; then cut the onion in half and tie it over the corn. If the corn is hard, tincture of iodine should be painted on. For protection from the shoe, cover the corn with an application of collodion.

Coughs.—Lemon juice with salt added, taken hot, will often prove effective. Three-grain tablets of ammonium chloride taken every three hours will loosen up the phlegm. Flaxseed tea, one teaspoonful given every three hours, will often shorten the duration of a cold.

Cracked Nipples.—Bathe the nipples twice a day with alum-water. This is made by placing a teaspoonful of alum in a glass of warm water. Washing the nipple with peroxide every three hours often proves efficacious.

Cramps in Stomach.—Apply a mustard plaster or a hot-water bottle to the abdomen; give a dose of salts; if relief is not obtained, place the patient in a bath as hot as can be borne.

Croup.—The application of hot turpentine stupes to neck and chest is often of value. The stupes should be made as follows: About thirty drops of turpentine to a teacupful of hot water. Give half a teaspoonful of syrup of ipecac every hour until vomiting occurs.

Dandruff.—Massage the scalp at night with sweet-oil; in the morning wash the hair with green soap. As a tonic, equal parts of glycerine, castor-oil, and bay rum is very good.

Delirium Tremens.—Place the patient in bed; cover with blankets; place a hot-water bottle to the feet. Give a glass of warm lemonade with a tablespoonful of salt added. If relief is not obtained, give two teaspoonfuls of paraldehyde.

Diabetes.—*Salicylate of Soda.*—Five-grain doses of salicylate of soda taken three times a day are highly recommended.

Water Hoarhound.—Fifty drops of the tincture of water hoarhound, four times a day, is an excellent remedy.

Milk.—In treating diabetes, the diet should consist chiefly of milk.

Diarrhea.—The first treatment in a case of diarrhea consists in cleansing out the bowels with castor-oil or Epsom salts.

The following remedies will prove beneficial:

Nutmeg and Egg.—Take one egg and beat it thoroughly; add about one-quarter of a fair sized grated nutmeg and sweeten to taste. Repeat three or four times a day, according to the severity of the case.

Blackberry Brandy.—One-half teacupful of blackberry brandy with a teaspoonful of Jamaica ginger added, is one of the best remedies. If necessary, the dose can be repeated every two or three hours.

Hot Milk.—A teacupful of hot milk sipped as hot as can be borne, and repeated several times a day, will very often stop the most severe cases of diarrhea.

Peppermint.—Fifteen to twenty-five drops of essence of peppermint in a little hot water, taken as hot as can be borne and repeated every two hours until four or five doses have been taken, will check diarrhea.

Flour.—A tablespoonful of flour well browned in a dry pan,

with sugar and boiled milk added, eaten hot, will quickly check the worst case of diarrhea.

Diphtheria.—Immediately put the child to bed and clean out the bowels with one grain of calomel. Spray the nose and throat every two hours with peroxide. A physician should be called, as an antitoxine must be given.

Dizziness.—Take a dose of phosphate of soda every second morning, and eat meat only once a day. Drink plenty of liquids, such as lemonade. Make tea from digitalis leaves and take a tablespoonful every four hours; as soon as relief is felt, stop the digitalis tea.

Dog Bites.—Remove the clothing from around the wound; pour on hot water; allow it to bleed freely. As an antiseptic, use tincture of iodine or a caustic pencil.

Dropsy.—Keep the patient at rest; give a dose of Epsom salts every morning. Make a tea of buchu leaves and give a tablespoonful every two hours. At night, give a wineglass of hot lemonade and cover well with blankets to induce sweating.

Dysentery.—Give a light but nourishing diet with plenty of fluids and but little vegetables and meats. Ten grains of bismuth subnitrate can be given every three hours.

Dysmenorrhea.—Take a teaspoonful of tansy tea every two hours; also take a hot bath up to the hips, and a strong cathartic.

Dyspepsia.—Regulate the bowels, and eat only at regular meal hours. If much gas is present, take half a teaspoonful of bicarbonate of soda in half a cup of hot water after meals, or any of the following remedies will be found very beneficial:

Lemon.—Add the juice of a quarter of a lemon to a teacupful of boiling water and drink as hot as possible every morning for two or three weeks; after which, discontinue the lemon and drink the hot water. This will in most cases prove beneficial and prevent a recurrence.

Baking-soda and Salt.—Take a quarter of a teaspoonful of baking-soda and a pinch of salt and add a teacupful of boiling water. Drink hot every morning, half an hour before breakfast.

Nux Vomica and Cinchona.—Five drops of nux vomica and twenty-five drops of cinchona taken three times a day, in water, before meals, is an excellent remedy for dyspepsia.

Peppermint.—Dyspepsia, with sudden, severe pains, can be relieved by adding a teaspoonful of essence of peppermint to a

teacupful of hot water; sip as hot as can be borne. The following prescription is highly recommended:

℞ Dilute Nitromuriatic Acid.....two drams
Tincture of Cardamom.....four drams
Tincture of Nux Vomica.....two drams
Mixture of Rhubarb and Soda.....one ounce
Mix.
Dose: Twenty drops in water, before meals.

Earache.—Clean out the ear with peroxide and put in five drops of glycerine. Keep the ear covered with warm flannels. Hot raisins placed in the canal of the ear often afford relief.

Eczema.—Clean the skin well with pure green soap and cover the area with sulphur paste. If there is itching, mix equal parts of carbolic salve and sulphur salve and apply.

Epilepsy.—Loosen the clothing around the neck; place a cork or spool between the teeth; hold the head upward and backward. Massage the arms and legs. If possible, pull out the tongue and dash cold water in the face.

Erysipelas.—Mix equal parts of flaxseed meal and slippery-elm bark; make a poultice and apply to the part every hour. If this does not give relief, paint the area with tincture of iodine. A wash containing borax and washing-soda often gives relief.

Eyes, Sore.—Do not touch the eyes unless the hands have been washed. Bathe the eyes with boric acid solution every two hours, and apply cold compresses over the eyes.

Fainting.—Allow fresh air; raise the feet and lower the head; give a teaspoonful of aromatic spirits of ammonia every two hours.

Felons.—Keep the finger or hand soaked in hot salt water. If this does not give relief, apply hot flaxseed poultices every half-hour.

Fever Sores.—Clean the lips well with warm water, and keep the parts covered with camphor ice or zinc salve.

Flatulency.—Take a teaspoonful of bicarbonate of soda in a glass of water; massage the abdomen; this often gives relief. Also take a strong cathartic.

Freckles.—Make a ten-per-cent. solution of saltpeter and apply to the face every night and morning. Another good remedy is to apply alcohol and lemon juice each night before retiring.

Frost-bites.—Soak the part in warm water, and gradually add more hot water until it is as hot as can be borne. A hot lemonade with brandy should be given.

Gall-stones.—Do not allow any food except a small amount of liquids, which should be hot. Give a hot bath and then wrap the patient in blankets and apply a hot-water bottle over the painful area.

Glands Enlarged.—Paint the swollen parts with tincture of iodine, and give sulphur and cream-of-tartar lozenges three times a day. If pain is severe, apply flaxseed poultice.

Gleet.—Do not take any heavy exercise; obtain eight hours' sleep and have a nourishing diet. As an injection, use hot salt water every four hours.

Gonorrhea.—Drink plenty of water; eat meat only once a day; and as an injection, use a one-per-cent. solution of potassium permanganate.

Gout.—If there is no pain, take plenty of outdoor exercise. Keep the bowels open, and give five drops of wine of colchicum every four hours. If there is pain, massage the area with oil of wintergreen.

Gravel.—The diet should contain plenty of raw fruits and vegetables. The bowels should be opened freely, and a tea of buchu leaves given in tablespoonful doses every four hours.

Grip.—Open the bowels freely; take ten grains of quinine with a hot lemonade at night. If not better the second day, take one five-grain tablet of phenacetine and salol every four hours.

Hay Fever.—*Sulphate of Zinc.*—Twenty grains of sulphate of zinc, one teaspoonful of borax, and seven ounces of rose-water, mixed and injected into the nostrils with an atomizer, three times a day, will be found very beneficial. The following should be taken internally:

Asafetida.—One five-grain pill three times a day.

Headache.—Take a hot mustard foot-bath, or a hot foot-bath, and if the pain is very severe, apply a mustard plaster to the back of the neck, and take any of the following remedies:

Lemon.—The juice of one lemon added to half a glass of warm water and repeated every twenty minutes is found very beneficial.

Peppermint.—Bathe the forehead with essence of peppermint and apply hot fomentations.

Aromatic Spirits of Ammonia.—Fifteen drops in a little water will quickly relieve the worst headache.

Peppermint and Baking-soda.—One-half teaspoonful of baking-soda and six drops of oil of peppermint added to a teacupful of hot water and taken as hot as possible is an old reliable remedy.

Heartburn.—*Nux Vomica.*—Five drops of nux vomica in water, three times a day, before meals.

Baking-soda.—A level teaspoonful of baking-soda and the juice of half a lemon added to a teacupful of water will give quick relief.

Heart-failure.—First give a dose of aromatic spirits of ammonia; keep the body covered and massage the limbs to keep up the circulation; apply something warm over the heart, and do not allow the patient to move until the doctor arrives.

Heat-stroke.—Undress the patient and sprinkle the body with cold water; keep ice to the head and allow the patient to inhale smelling salts.

Hiccoughs.—Take one tablespoonful of lemon juice and salt; if this does not give relief, take five grains of quinine with a large glass of water.

Hives.—Take a bath in warm washing-soda solution. A Seidlitz powder is to be taken each morning before breakfast, and five grains of cascara at night.

Hoarseness.—Apply cold cloths or strips of fat bacon to the neck, and gargle with equal parts of Dobell's solution or salt and water. Internally, pure lemon juice and sugar is beneficial.

Honey.—One-half teacupful of strained honey and the juice of two lemons taken in teaspoonful doses several times a day is very beneficial.

Horseradish.—Take two ounces of grated horseradish and a pint of water, and boil on a very slow fire for an hour, and strain; then add two tablespoonfuls each of vinegar and sugar. Take one teaspoonful every half-hour.

Borax.—Dissolve a small piece of borax in the mouth, two or three times a day.

Hysteria.—Keep the patient quiet in a dark room; give fifteen grains of potassium bromide every three hours, and a strong laxative at night.

Indigestion.—The bowels must be properly regulated; eat only at regular meal hours. If much gas is present, take half a teaspoonful of bicarbonate of soda in half a cup of hot water after meals. Any of the following remedies will be found beneficial:

Nux Vomica and Cinchona.—Five drops of nux vomica and twenty-five drops of cinchona taken three times a day before meals is an excellent remedy.

Lemon.—Add the juice of a quarter of a lemon to a teacupful of boiling water and drink as hot as possible every morning for two or three weeks; after which discontinue the lemon but drink the hot water. This will in most cases prove beneficial and prevent a recurrence.

Baking-soda and Salt.—Take a quarter of a teaspoonful of baking-soda and a pinch of salt and add a teacupful of boiling water. Drink hot every morning half an hour before breakfast.

Peppermint.—Indigestion with sudden severe pains can be relieved by adding a teaspoonful of essence of peppermint to a teacupful of hot water; sip as hot as possible. The following prescription is highly recommended:

℞ Dilute Nitromuriatic Acid.....two drams
Tincture of Cardamom.....four drams
Tincture of Nux Vomica.....two drams
Mixture of Rhubarb and Soda.....one ounce
Mix.
Dose: Twenty drops in water, before meals.

Influenza, Spanish.—Keep the patient in bed; give hot drinks and five grains of quinine every three hours. Castor-oil is the best laxative for this condition. Wash the head and face with alcohol, and give only light, nourishing diet.

Ingrowing Toe-nail.—Paint the toe with iodine; cut a wedge out of the middle of the nail and strap back the flesh from the edge of the nail with adhesive tape. At night, apply resin cerate and bandage the toe.

Insomnia.—Before going to bed, take some light exercise, especially to develop the chest-muscles and breathing; then take a cup of hot milk, or water flavored with lemon juice. Do not eat for at least four hours before retiring.

Itch.—Use only clean towels that have been thoroughly boiled; wash the skin twice a day and moisten the affected area with

tincture of larkspur. Apply sulphur salve or blue ointment to the parts.

Ivy-poisoning.—Do not touch other parts of the body after touching the infected parts, and wash the skin with a strong laundry soap. Then saturate the skin with a strong solution of sodium hypophosphite.

Kidney Trouble.—Eliminate meats from the diet; drink fluids copiously and take a hot drink each night to induce perspiration. During the day, take a tablespoonful of Basham's mixture every four hours, or use any of the following remedies:

Red Pepper (*Capsicum*).—A capsicum plaster applied over the painful area will give relief.

Sheep Sorrel.—Take two ounces of sheep sorrel and boil in one quart of water on a very slow fire; strain and cool. Drink a wineglassful two or three times a day.

Hops.—Take two ounces of hops and boil very slowly in one quart of water for half an hour. Take one teaspoonful of this, in water, three times a day.

Peppermint.—Fifteen to twenty-five drops of essence of peppermint in water, taken four times a day, has proved beneficial.

Or:

℞ Acetate of Potash.....two teaspoonfuls
Fluidextract of Buchu.....six teaspoonfuls
Sweet Spirits of Niter.....six teaspoonfuls
Fluidextract of Hydrangea.....four teaspoonfuls
Mix.
Dose: One teaspoonful every three hours.

Lead Colic.—Take plenty of outdoor exercise; a dose of salts each morning, and five grains of iodide of potash after each meal. During an attack, rest in bed, with a hot-water bottle to the abdomen, gives relief.

Leucorrhea.—To two quarts of water add two teaspoonfuls of common table salt, bicarbonate of soda, and borax. Use this in a douche as hot as can be borne, twice a day.

Liver Complaint.—Do not eat meats for several days; take four grains of gray powder after each meal. If relief is not obtained, take a teaspoonful of dandelion tea every four hours.

Lockjaw.—Place the patient in a dark room; keep the body warm, and give inhalations of chloroform until doctor arrives.

Lumbago.—Apply hot dry flannels to the loins; give a strong dose of salts, and massage the muscles night and morning with oil of wintergreen. Take one drop of tincture of aconite in water four times a day. The following prescription is highly recommended:

℞ Antipyrine ..... two drams
Soda Salicylate ..... two drams
Water ..... one teacupful
Mix.
Dose: One teaspoonful in water three times a day.

Malaria.—Give three grains of quinine every four hours; keep the bowels open; plenty of fresh air. For quick relief, give small doses of syrup of ipecac.

Measles.—Keep the child in a dark room; give cold drinks, as lemonade or half a teaspoonful of sweet spirits of niter in water. Rub the hands and feet with olive oil. For scaling, apply boric acid salve to the skin.

Melancholia.—Brighten up the home; take outdoor exercise and keep the mind occupied. Three-grain asafetida pills, taken one after each meal, often prove of value.

Membranous Croup.—Immediately consult a physician so that antitoxine may be given. Keep the child quiet, and allow it to inhale the fumes from a cloth saturated with salt and vinegar.

Meningitis.—Consult a physician; apply cold cloths to the head and spine; keep the bowels open, and do not excite the patient.

Menses, Excessive.—Avoid all strenuous work; take the juice of one lemon three times a day, and apply cold towels to the lower part of the abdomen.

Menses, Suppressed.—Take five grains of quinine three times a day; a hot mustard bath at night and a vaginal douche of hot salt water. Cold towels applied to the lower part of the spine often give relief.

Menstrual Headache.—Take a glass of hot water in the morning before breakfast and a hot hip-bath at night before retiring. Keep the bowels regulated and drink tea during the day. Avoid all drafts, and if relief is not obtained take three grains of phenacetine every four hours.

Milk Leg.—Keep the leg elevated; apply cold applications of Burow's solution. Take salts in the morning for the bowels, and eat nourishing food.

Miscarriage.—Immediately lie down in bed; apply cold towels to the abdomen, and take a teaspoonful of fluidextract of ergot after each meal for one day. It is necessary to stay in bed for at least three days.

Morning Sickness.—A tablespoonful of lime water in a glass of milk is an excellent remedy.

Baking-soda.—One-half teaspoonful of baking-soda in a glass of water is a good old reliable remedy.

Mosquito Bite.—Wash the part with strong laundry soap; apply peroxide of hydrogen pure, and then rub in some oil of citronella to prevent further infection.

Mouth Sores.—Take hot water before each meal; keep the bowels open, and use Dobell's solution as a mouth-wash. Do not put pins in the mouth, as they may cause abscesses to form.

Mumps.—Open the bowels with calomel, and give only a liquid diet. As soon as the swelling begins to go down, apply a hot bean poultice; simply boil the beans and use as poultice.

Muscular Rheumatism.—A dose of Rochelle salts should be taken each morning. Massage the painful area with oil of wintergreen, and take hot baths night and morning.

Nausea.—Drink a cup of hot water every few minutes with a teaspoonful of bicarbonate of soda added. A teaspoonful of aromatic spirits of ammonia given in ice-cold water is good. If vomiting is persistent, apply a mustard plaster to the pit of the stomach.

Nephritis.—Absolute rest in bed, or moderate exercise, as walking; light diet, with no meats, and Epsom salts each morning. No alcohol should be taken, and it is especially advisable to avoid all drafts.

Nervousness.—A tea made of hops taken in wineglassful doses often gives relief. If the case is of long standing, give one teaspoonful of tincture of valerian every four hours.

Neuralgia.—Keep hot-water bottle to the side of the face; avoid all drafts and exposure. Internally, five grains of phenacetine three times a day often gives relief.

Night Sweats.—Take a warm bath each night before retiring. Make a tea from sage leaves and take a tablespoonful before meals. After meals, take five drops of tincture of belladonna in a wineglass of water.

Nipples, Sore.—Alum-water is good to harden the nipples, and alcohol is also very valuable. If the nipple is cracked, apply glycerine and tincture of benzoin.

Obesity.—Take plenty of outdoor exercise; drink a glass of hot water with lemon juice before each meal, and keep the bowels open. A hot bath with massage is also of value. Light muscular exercise in the morning before breakfast is beneficial.

Offensive Breath.—Eat only at regular meal hours; include buttermilk in the diet. Use Dobell's solution as a mouth-wash. Have a dentist examine the mouth carefully for any cavities or defective bridge work.

Painter's Colic.—Give a purge of Rochelle salts; apply hot turpentine stupes to the abdomen; and give five grains of potassium iodide three times a day. Only liquid diet should be given.

Perspiration.—To remove the odor, use household ammonia in the bath. A one-per-cent. solution of potassium permanganate applied night and morning is of value.

Piles.—Rest in bed as much as possible; take mineral oil in tablespoonful doses night and morning, to move the bowels. If the bowel movements are painful, insert a glycerine suppository each night. Applications of nutgall ointment will often give relief.

Calomel.—A salve made of one teaspoonful each of calomel and lard and applied on a small pledget of absorbent cotton will give relief.

Sulphur.—Equal parts of sulphur and glycerine thoroughly mixed and applied three times a day has given good results.

Pimples.—Use only pure Castile soap to clean the face. Each night steam the face, and apply sulphur salve before retiring.

Pinworms.—The best remedy is an infusion of quassia chips, about one ounce of chips boiled up in a pint of water. Strain, and divide this into two parts and inject as hot as possible, night and morning.

Pleurisy.—*Mustard Plasters.*—Apply mustard plasters quite frequently over the affected area. When the plasters are not in

use, apply a hot-water bottle. If fever is high, give three drops of tincture of aconite every three hours.

Turpentine.—A piece of flannel wrung out in hot water, to which has been added fifteen drops of turpentine, applied to the painful area, and repeated when necessary, will prove beneficial.

Pleurisy-root.—Take two ounces of pleurisy-root and steep it in one quart of boiling water for one hour; strain through a fine muslin. Take three or four teaspoonfuls of this fluid to a teacupful of hot water and drink while hot; repeat three or four times.

Pneumonia.—Flaxseed poultices continually applied over the chest and to the soles of the feet are a great aid in the successful treatment of pneumonia.

Turpentine and Lard.—Apply hot lard to the chest and then rub hot turpentine on. Do this several times a day. Keep the chest covered with a piece of flannel saturated with kerosene oil.

Onions.—A poultice made of chopped onions fried in lard for a few minutes on a slow fire, applied to the chest and soles of the feet, is an excellent aid in the treatment of pneumonia.

Cloths wrung out in ice-water and applied to the chest will localize the disease. Give an enema each day. The diet should be light and nourishing. For elderly persons, give fifteen drops of tincture of digitalis every three hours.

Poisoning.—Give lukewarm water with salt in large quantities and insert finger in the mouth to induce vomiting. Keep the body warm, and after vomiting, give white of egg and milk.

Proud Flesh.—Clean the parts with hot water, followed by peroxide. Each night and morning use burnt alum on the part.

Quinsy.—Give small doses of calomel until the bowels are open. Apply cold cloths to the neck, and give five grains of salol internally after each meal.

Rheumatism.—For painful joints, apply oil of wintergreen and wrap the joint in absorbent cotton. Rochelle salts should be taken each morning before breakfast. The juice of one lemon should be taken before each meal. A hot bath at night will often relieve the pain and induce sleep. The baking cure is carried out at home by heating dry flannels in the oven and applying

them over the joints. The following prescriptions have given good results:

℞ Salicylate of Soda.....one tablespoonful
Water .....one teacupful
Mix.
Dose: One teaspoonful in water every two hours.

℞ Iodide of Potash.....one tablespoonful
Syrup of Sarsaparilla.....one teacupful
Water .....one-half teacupful
Mix.
Dose: Two teaspoonfuls in water every three hours.

While taking either of the above treatments, Epsom or Rochelle salts in small doses every morning is highly recommended.

Ringworm.—Paint the area with tincture of iodine and apply an ointment of resin cerate. Ammoniated mercury ointment often proves of value, also.

Roundworms.—A good remedy is to make a tea of American worm-seed, using one teaspoonful of seeds to a pint of water. Give a wineglassful of the tea three times a day before meals. The bowels should be kept open with salts. Another effective remedy is to give one-grain tablets of santonine, night and morning, for three days.

Rupture.—Rest in bed; give cold applications, and also a low enema. Consult a physician at once, as the bowel may become obstructed.

Salivation.—Do not drink much water or liquids, and use a mouth-wash of borax solution, a teaspoonful of powder to a glass of water.

Scalds.—Apply linseed oil and lime-water; cover the part with clean linen, and apply boric acid vaseline after a few hours.

Scarlet Fever.—Keep the nose and throat clear; see that the bowels move, and give plenty of liquids to drink. If fever remains high, apply cold cloths to head. Milk should be the only food given.

Shingles.—Apply zinc salve to the affected parts, and keep the body clean; take a hot bath each night. Blaud's pills are recommended for the blood, one five-grain pill after each meal.

Sleeplessness.—Regulate the diet; drink hot milk before going to bed, and during the day take a teaspoonful of tincture of valerian after each meal.

Smallpox.—As soon as suspected, keep all persons away. Call a physician, and give a big dose of castor-oil. All persons in contact with the case should be vaccinated.

Sore Eyes.—Be careful of towels and linen used. Bathe the eyes with boric acid solution three times a day, and apply cold cloths to the eyes.

Sore Throat.—Open the bowels with small doses of calomel. Gargle every three hours with Dobell's solution. The diet should be light and nourishing. Keep all other children away.

Salt.—One teaspoonful of salt added to a teacupful of warm water makes an excellent gargle.

Alum.—One teaspoonful of powdered alum dissolved in a teacupful of warm water and used as a gargle several times a day is an old remedy, but a good one.

Cold Packs.—Cold cloths constantly applied to the throat seldom fail to give relief.

Bacon.—Strips of bacon or fat salt pork applied to the throat is a good, reliable treatment.

Sprains.—Apply hot water and massage. Keep the part elevated and at rest. Later, rub in some camphorated oil.

Stiff Neck.—Apply camphorated oil to neck and bandage with a piece of flannel. A dose of castor-oil should be given at once.

Stings of Insects.—Wash the part with laundry soap and apply some ammonia-water. Tincture of iodine painted over the affected area often gives relief.

St. Vitus's Dance.—Keep the child outdoors; keep the bowels open, and give a nourishing diet. Allow at least ten hours' sleep. Give five grains of salicylate of soda every three hours.

Sty.—Bathe the eye with boric acid solution every two hours, and apply a one-per-cent. yellow oxide mercury ointment to the eye each night.

Summer Complaint.—Clean out the bowels well with castor-oil. Give a nourishing diet, but no meats. One teaspoonful of chalk mixture every three hours often gives relief.

Sunburn.—Keep the parts soaked with Burow's solution; if pain is not relieved in six hours, apply boric acid vaseline or cocoa butter.

Teething.—Allow the baby to chew on something hard, to break the gums; if there is much crying, rub the gums with paregoric.

Tonsilitis.—Take a good laxative, and follow with five grains of salol every three hours. As a gargle, use a teaspoonful of iron in a wineglass of warm water; equal parts of alcohol and water is also an excellent gargle.

Toothache.—Examine the teeth for cavities; use warm Dobell's solution as a mouth-wash. If there is a cavity, clean it out with peroxide and insert a piece of absorbent cotton saturated with oil of cinnamon. Paint the gum with equal parts tincture of aconite and iodine.

Tympanites.—Regulate the diet, and drink sour milk with the midday meal. Take a dose of salts. If there is great pain, insert a rectal tube high up in the rectum.

Ulcer.—Clean the ulcer and surrounding skin each day with hot water; next apply peroxide, and then a covering of zinc salve. Rest the part as much as possible.

Varicose Veins.—During the day, when the legs cannot be rested or raised up, they should be bandaged, preferably with a rubber bandage. Cold applications of boric acid solution will often give relief.

Vomiting.—Rest for an hour or two; drink hot water, and apply a mustard plaster or a hot-water bottle to the abdomen. Fifteen grains of bismuth should be given each time the attack of vomiting begins.

Warts.—Apply nitric acid to the wart, just one drop from the tip of a toothpick; if it runs on the skin, wash off the acid at once and apply boric acid vaseline. Fluidextract of thuja applied to a wart is a slow but often sure way of removing it.

Water-brash.—The best results are obtained from a teacupful of hot water containing half a teaspoonful of bicarbonate of soda. Only three meals a day should be taken, at regular intervals.

Whooping-cough.—Place a strap around the child's chest so as to prevent too great a strain on the muscles. Give one grain of antipyrine every three hours. Keep the child outdoors all the time, and at night burn a vapo-cresoline lamp. If the diet is not watched closely, the child will become emaciated from vomiting.

Womb, Falling of.—In the early stages warm vaginal douches of infusion of white-oak bark will restore the womb to place. In

the later stages, however, it will be necessary to consult a physician, as tampons or pessaries will have to be inserted.

Worms.—For remedies for Tapeworm, Pinworm, and Roundworm, see under their respective names.

Wounds.—Wounds of small size should be allowed to bleed for a while after the injury. Do not worry about the loss of blood. Apply any antiseptic, as iodine, alcohol, turpentine, or peroxide. Keep the wound as clean as possible, and if the bleeding persists bandage tightly. Ordinarily, if the edges of a wound come together, it should heal in a few days. When there is a gap in the wound, and the edges are more than half an inch apart, the tissue must grow up from the bottom and then new skin has to grow over the top. This necessitates a longer time and increases the chances of getting the wound infected. It is therefore evident that an attempt should be made to bring the edges of all wounds in close contact.

LEMONS

1. *Dropsy.*—Take the juice of one lemon a day, and gradually increase to five or six lemons. Take a hot bath every night during this treatment.
2. *Heartburn.*—Slowly suck the juice of from one to two lemons, which is generally sufficient to give relief.
3. *Sore Throat.*—Occasionally suck the juice of a lemon. Continue until relief is obtained.
4. *Hiccough.*—Suck the juice of one lemon at intervals of five to ten minutes until the hiccough disappears.
5. *Colds.*—Add the juice of two lemons to the same quantity of strained honey, and mix thoroughly. Take a teaspoonful of this mixture every ten or fifteen minutes.
6. *Chills.*—Take the juice of one large or two small lemons and add one pint of hot water. Sweeten to taste. Drink as hot as possible upon retiring and cover up warmly.
7. *Rheumatism.*—Take the juice of several lemons every day and in a short time all signs of rheumatism will disappear.
8. *Spanish Influenza and La Grippe.*—Take a teacupful of hot lemonade every ten or fifteen minutes. At the same time take five-grain doses of quinine every three or four hours until four doses have been taken. Remain in bed for three days and keep the body well covered.

9. *To Remove Tan.*—Bathe the skin with lemon juice.
10. *Sty on the Eyelid.*—Bind a small piece of lemon on the closed lid, changing it every two hours.
11. *Corns.*—Bind a piece of lemon over the corn every night for four or five nights.
12. *Itching of Anus.*—Lemon juice has been found very beneficial. It should be applied locally two or three times a day.
13. *Asthma.*—Persons suffering from asthma should drink the juice of two or three lemons every day.
14. *Scurvy.*—The juice of one lemon taken three times a day is very beneficial in the treatment of scurvy.
15. *Headache.*—The juice from half a lemon added to a cup of strong tea will generally relieve the most severe headache.
16. *Erysipelas.*—The juice of lemons applied to the affected parts will quickly stop the spread of erysipelas.
17. *Hoarseness.*—To the juice of two lemons add the same quantity of strained honey, and mix thoroughly. Take a teaspoonful of this mixture every ten or fifteen minutes.
18. *Blood-poisoning.*—The juice from one lemon taken three or four times a day is very beneficial in the treatment of blood-poisoning.
19. *For Removing Ink-stains from the Hands.*—Rub the hands thoroughly with half a lemon.
20. *Tooth and Mouth Wash.*—The juice of half a lemon added to half a glass of water makes an excellent tooth-wash, removing the tartar and whitening the teeth.
21. *Liver Troubles.*—Those persons who suffer from liver troubles should take a teacupful of hot water to which the juice of half a lemon has been added, half an hour before breakfast. They should also use the juice from two or three lemons every day.
22. *Diphtheritic Sore Throat.*—Suck the juice from a quarter of a lemon every two hours.
23. *Felons.*—When a felon is first discovered on the finger, take a lemon and cut one end off, cutting the fiber so there will be a hole made into which the finger can be inserted. The bowels should also be kept open with Epsom salts or castor-oil.
24. *Fevers.*—In cases of most fevers lemonade will be found of very great benefit to the patient.

25. *Hemorrhage.*—Lemon juice and an equal amount of ice-water taken every hour or two will usually stop a hemorrhage.
26. *Jaundice.*—The juice of a quarter of a lemon in a teacupful of boiling water taken half an hour before breakfast, and the same amount of lemon juice taken three or four times a day, is one of the best treatments for jaundice.
27. *Grip.*—Before retiring take a hot mustard foot-bath, followed with ten grains of quinine and two teacupfuls of hot lemonade. Remain in bed the following day and drink plenty of hot lemonade. Take a five-grain tablet of quinine every four hours.
28. *Coughs.*—Add the juice of two lemons to the same quantity of strained honey, and mix thoroughly. Take a teaspoonful of this mixture every ten or fifteen minutes.
29. *Biliousness.*—A tablespoonful of lemon juice with an equal amount of water taken three or four times a day has given splendid results in the treatment of this complaint.

KEROSENE

1. *Corns.*—A piece of cotton saturated with kerosene and bound around the corn every night for four or five nights will help a great deal toward its removal.
2. *Cold in the Throat and Chest.*—Put ten or fifteen drops of kerosene on a piece of loaf sugar and dissolve it in the mouth. Repeat every hour or two until relieved.
3. *Burns.*—Apply a cloth saturated with kerosene oil and keep it well moistened.
4. *Toothache.*—When the tooth has a cavity, saturate a piece of cotton with kerosene oil and insert it in the cavity.
5. *Sore Throat.*—Saturate a piece of cloth with kerosene oil and apply it to the throat, keeping it well moistened.
6. *Diphtheria.*—Swab the throat every three hours with kerosene or petroleum oil. Petroleum oil is prescribed by most physicians, and can be purchased at the drug store.
7. *Croup.*—Apply a cloth saturated with kerosene oil to the child's throat, at the same time giving it a lump of sugar to which two or three drops of kerosene have been added. This is a quick and most reliable remedy.

8. *Appendicitis.*—Kerosene oil rubbed well into the body over the painful area will help to relieve the inflammation.
9. *Dandruff.*—Kerosene rubbed into the scalp three or four times a week will remove dandruff.
10. *Rheumatism.*—Kerosene oil rubbed over the affected part several times a day is an old reliable remedy for this disease.
11. *Quinsy.*—Cloths saturated with kerosene and applied to the throat very often afford great relief to the patient.
12. *Falling Hair.*—Kerosene oil well rubbed into the scalp four or five times a week will prevent the hair from falling out.
13. *Bunions.*—Absorbent cotton saturated with kerosene oil and applied to the bunion every night for a week or ten days will give excellent results.

SALT

1. *Colic.*—In the beginning of colic, add a teaspoonful of salt to a teacupful of cold water and drink it. This will quickly relieve the pains.
2. *Sore Eyes.*—Bathe the eyes with a weak solution of salt and water several times a day and the inflammation will quickly disappear.
3. *Fits.*—If the patient can swallow, give a solution of salt and water; or force salt into the mouth if the lips can be opened.
4. *Diarrhea.*—Put one tablespoonful of salt and two tablespoonfuls of vinegar into a teacupful of hot water. Mix thoroughly. Give from one teaspoonful to two tablespoonfuls every ten minutes, according to the age of the patient. Drink as hot as possible.
5. *Piles.*—Inject into the rectum, two or three times a day, a small quantity of a strong solution of salt and water.
6. *Burns.*—Salt moistened and applied to flesh burns will prevent blistering.
7. *Sprains and Bruises.*—Bandage and apply a hot solution of salt and water. Keep the bandage wet with the solution.
8. *Neuralgia.*—Apply a strong hot solution of salt and water to the affected part.
9. *Catarrh.*—Add a pinch of salt to half a teacupful of sweet milk and apply to the nostrils with a nasal douche three or four times a day.

10. *Cholera Morbus.*—Take a tablespoonful of salt, two tablespoonfuls of cider vinegar, one teaspoonful of black pepper, and add one teacupful of water. Mix thoroughly. The dose is from one teaspoonful to one tablespoonful, according to the age of the patient. Repeat every fifteen minutes until relieved.
11. *Toothache.*—Where there is a cavity, take a very strong solution of salt and water, with an equal amount of spirits of camphor. Saturate a small piece of absorbent cotton with this solution and fill the cavity of the tooth.
12. *Bleeding from the Lungs.*—Every twenty minutes take half a teaspoonful of salt until the bleeding stops.
13. *Coughs.*—A pinch of salt will usually stop a cough.
14. *Hives.*—Bind salt to the back of the neck. Continue this treatment for a week or two. In most cases the hives will disappear.
15. *Convulsions.*—If the patient can swallow, give a solution of salt and water.
16. *Purgative.*—Add one tablespoonful of salt to one pint of warm water, and inject into the rectum, retaining as long as possible.
17. *Diarrhea.*—A teaspoonful of salt added to one tablespoonful of lemon juice and taken at intervals has proved successful in some cases of diarrhea.
18. *Pain in the Stomach.*—Half a teacupful of water to which has been added half a teaspoonful of salt will often relieve the pain.
19. *Painters' Colic.*—Keep a hot application of salt in small bags on the lower part of the abdomen. At the same time have the patient drink a small quantity of salt and water.
20. *Sore Throat.*—Gargle three or four times a day with salt and water.
21. *Heartburn.*—Dissolve a pinch of salt in the mouth. If not relieved in a few minutes, repeat the dose.
22. *Worms (Pin or Thread).*—Inject into the rectum every night about a teacupful of strong solution of salt and water. Four or five treatments will be necessary for the removal of the worms.
23. *Dyspepsia.*—A pinch of salt and baking-soda added to a cup of boiling water, and taken as hot as possible half an hour

before breakfast every morning, will usually prove beneficial.

24. *Erysipelas.*—Apply a strong solution of salt and water to the affected parts several times a day.
25. *Dandruff.*—Bathe the scalp once a day with a solution of salt and water.
26. *Teeth.*—Clean the teeth three or four times a week with salt. It makes them white and hardens the gums. This should be done in addition to the regular daily brushing.
27. *Apoplexy.*—A pinch of salt placed on the patient's tongue has been found beneficial.
28. *Enemata.*—One tablespoonful of salt added to one pint of warm starch water makes an excellent injection.
29. *Emetic.*—Salt is used successfully as an emetic for most poisons. (See Poisons.)
30. *Fainting.*—Rub salt on the chest of the patient, and if possible place a pinch of salt on the tongue.
31. *Sunstroke.*—A solution of salt and water injected into the veins is an infallible cure for sunstroke, but this can only be done by a physician.
32. *Dysentery.*—A teaspoonful of salt added to a tablespoonful of lemon juice and taken at intervals has proven very beneficial in some cases of dysentery.
33. *Felons.*—A teaspoonful of roasted salt, a teaspoonful of turpentine, and enough pulverized Castile soap to make a poultice, is an excellent remedy for felons.

APPLE

This fruit is rich in acid substances, and these are mainly malic acid and picric acid. Apples, besides being nutritious, are valuable as a stimulant to the digestive tract. The fruit can be baked, stewed or eaten raw; if eaten raw, the skin should be removed.

Medicinal Properties.—By regulating the digestive tract apples act as a preventive of other diseases. People with a sallow complexion from liver disorders will show an improvement by eating at least two apples a day. The juice of apples, served cold, is valuable for all fevers.

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PUMPKIN *(Cucurbita pepo)*

Used in the treatment of tapeworm and inflammation of the bladder

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APPLE *(Pyrus malus)*

Eaten night and morning act as a gentle laxative

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BEET *(Beta vulgaris)*

Used in the treatment of gravel and amenorrhea

WHITE NAVY BEANS

The strings are removed, the beans cleaned in cold water, cut in small pieces, and boiled thoroughly. The fresh string-beans are very nutritious and may be added to the diet of the sick; in fact, they are allowed in all diets.

The dried beans are very nutritious because of the albumen they contain, and in this respect they are more valuable than flour materials. The dried beans can be boiled in various forms, and in soups they make a tasty and nutritious dish. Another method of cooking them is to bake the beans with salt pork.

Medicinal Properties.—A poultice of white navy beans, which is made by boiling the beans down to a pulp, is very valuable. These poultices, if applied very hot and renewed frequently, have a very powerful drawing effect on inflammatory conditions, as boils, pleurisy, and erysipelas in mild form.

BEETS

Fresh garden beets contain a basic principle which has been used medicinally for years. The beets are boiled in water until soft, then crushed and the liquid part strained off. This is boiled until it is thick, like a syrup. The dose usually given is a wineglassful three times a day.

Medicinal Properties.—The above-mentioned syrup has a decided effect on the womb. It has been recommended for delayed and painful menstruation resulting from exposure to cold.

Many cases of kidney trouble have improved under this treatment. It is also beneficial for relief of stone in the bladder, and is recommended for that common condition known as cold, or catarrh, of the bladder.

CAULIFLOWER

If the vegetable is obtained fresh, and properly cooked, it makes a delicate and digestible dish. Thorough cooking is necessary to obtain the active principle.

Medicinal Properties.—For years cauliflower has been recommended for indigestion. It is also valuable for urinary trouble, especially when the latter is located in the bladder.

CARROTS

This vegetable may be boiled or eaten raw. In both cases, as a matter of cleanliness, they should be scraped and washed. Raw carrots are very nutritious and may be used freely as a diet.

Medicinal Properties.—A poultice of raw carrots and flaxseed meal is valuable for healing ulcers, and in many cases healing of bed-sores has resulted from its use. Raw carrots eaten between meals have a decided effect on inflammatory conditions of the kidneys. Because of the iron present in carrots, they are recommended as a blood tonic and tend to clear the complexion.

CELERY

Fresh young stalks of celery should be included in all diets. There is a valuable ingredient extracted by boiling and crushing the whole stalk. This liquid is strained and given while hot. The addition of a little salt makes it a very inviting drink.

Medicinal Properties.—The tea of celery is beneficial in cases of chronic rheumatism. It should be taken in a glassful dose about three or four times a day. For nervousness not due to a chronic disease, the drinking of hot celery tea will often give relief. The stalks of celery, eaten raw, will act as a tonic to increase the appetite and aid digestion.

GRAPES

This fruit is very nutritious, and is to be recommended as a diet where there is a total distaste for food. The seeds are the only part of the grape which should not be eaten; although there is no harm derived immediately, in later years they cause bowel trouble and appendicitis. Grapes should always be washed before eating them, because they are exposed to the air for a long time.

Medicinal Properties.—Grapes are recommended as a very efficient remedy for constipation. The body must gradually be accustomed to this change in diet. The first day half a pound is taken, and each day half a pound more is eaten, until the daily portion is about ten pounds. Then the grapes are gradually

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CARROT *(Carota)*

Used in the treatment of ulcers and kidney troubles

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CELERY *(Apium graveolens)*

Beneficial in the treatment of chronic rheumatism and nervous troubles

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GRAPE-VINE *(Vitis vinifera)*

Highly recommended for the treatment of dropsy and chronic dysentery

GRAPE FRUIT

A mild laxative; beneficial in biliousness and fevers; improves appetite.

excluded from the diet. The juice extracted from grapes is a good blood tonic and increases the flow of gastric juice.

GRAPEFRUIT

This fruit has become very popular of late, because it is nutritious and easily digested. It may be sweetened to suit the taste, but no milk or cream should be used for at least half an hour after eating.

Medicinal Properties.—The juice is known to act as a mild laxative. If the juice is taken, without sweetening, before two meals a day, it will often relieve biliousness. It can also be used to increase the appetite. The juice of the fruit made up as a cold drink will be found of value in reducing fevers.

HORSERADISH

This is something to be used sparingly in all diets. Horseradish is not recommended for its food value, and those people known to have weak stomachs should avoid it entirely. It may be made into a tea, and if not tasty, sugar or honey can be added to make a syrup.

Medicinal Properties.—Horseradish is a valuable remedy for sore throat and cold in the chest. If horseradish tea is combined with gin, it relieves the pain of suppressed menses. In many cases of rheumatism the tea of horseradish induces perspiration, which carries off the poison. This is not an immediate cure, as results may not be found until after a month of treatment.

LETTUCE

The principal ingredient in this vegetable tends to induce a mild form of sleep. It is not classed as a narcotic, but it may be used as a substitute. Lettuce is usually served with vinegar; if the acid of the vinegar does not agree with a person, lemon juice with a little sugar may be substituted for the vinegar.

Medicinal Properties.—Lettuce is a valuable part of the diet because of its effect on the nerves and urinary system. Lettuce leaves eaten at night with toast is easy to digest and often produces a normal sleep. People who are of a nervous temperament from eating too much meat should eat lettuce at least twice a day.

LEMON

The juice of this fruit is a stimulant and should be included in most diets. The juice from the lemon may be squeezed out and taken in water, or sugar may be added to suit the taste. Another good method of extracting the juice is to soak the lemon in boiling water for half an hour and then suck the juice from one end.

Medicinal Properties.—Lemon juice tones up the stomach and is an excellent remedy for biliousness. It is best to give the juice in hot water before meals. Lemons are also beneficial in tonsilitis and rheumatism; for this, the juice of several lemons should be taken night and morning. It is also valuable for coughs and hoarseness. A hot lemonade taken every three hours will induce perspiration and relieve the pains of influenza. The juice of lemon used externally will whiten the skin and remove sunburn.

ONIONS

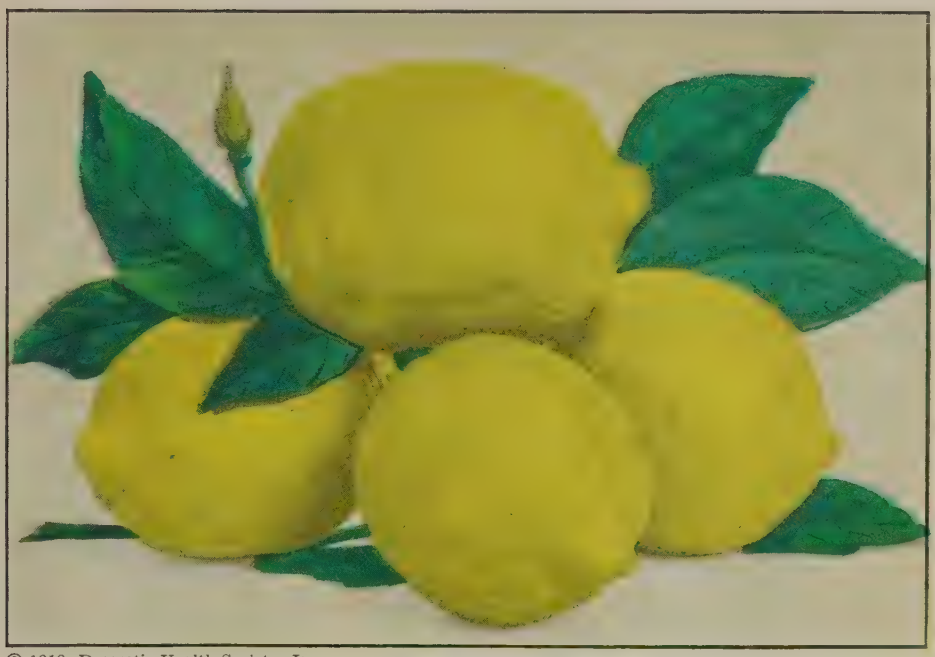
The juice of onions has been used as a substitute for drugs for many years. The active principle is best obtained from raw onions. If the onions are boiled, they should be pressed to extract all the juice.

Medicinal Properties.—As an expectorant, the raw juice given in teaspoonful doses every four hours is best. A syrup made from onion juice gives relief in children suffering from croup. Raw onions used as a poultice for pleurisy, boils, and ulcers are effective. A little of the raw juice is of great benefit in cases of poor digestion with gas in the bowel. In children with a fever, the placing of sliced raw onions at the feet will often give relief.

ORANGES

This fruit should be included in the daily diet. For young children it is best to squeeze out the juice, because the pulp is very hard to digest.

Medicinal Properties.—The raw juice is a mild laxative. If sweetened a little and served cold it is very refreshing in fevers. The acid present in orange juice will curdle milk, and in children care must be observed not to give both at once. Children suf-



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LEMON *(Citrus limonum)*
Used for twenty-nine diseases

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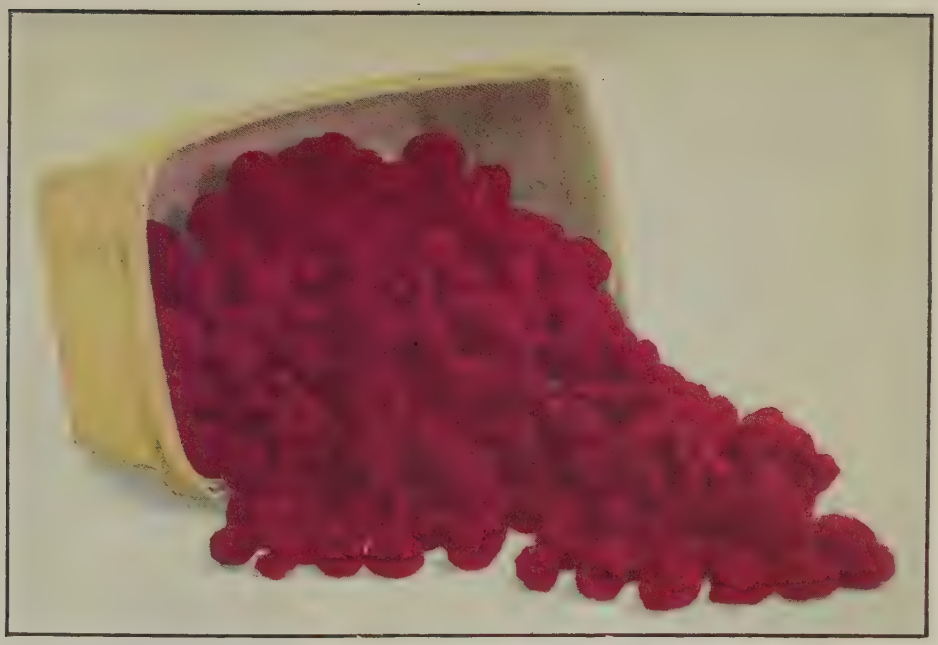
TOMATO *(Lycopersicum esculentum)*
Used in the treatment of cholera infantum



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RASPBERRIES

Beneficial in the treatment of colds, grippe and influenza

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ONION *(Allium cepa)*

Used in the treatment of pleurisy, catarrh and croup

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RED PEPPER *(Capsicum)*

Used in the treatment of Spanish influenza and La Grippe

fering from scurvy or malnutrition will show quick improvement from the giving of orange juice three times a day.

PARSLEY

This vegetable contains an oil which is stimulating to the body. Its main action is on the urinary system. In small amounts, parsley is used as a flavoring agent. The essential oil is extracted by making a tea from the fresh roots and leaves.

Medicinal Properties.—The tea of parsley is valuable for decreased flow of urine and inflammation of the bladder. In cases of dropsy, parsley will often give relief. The leaves of parsley, if crushed and applied hot, are recommended for inflammatory conditions.

PEPPER

Cayenne pepper contains a very irritating oil which is valuable as a stimulant to the digestive system. This should not be given more than twice a day. Either an infusion is used, or else a small amount of the red pepper is mixed with the food.

Medicinal Properties.—A mixture of cayenne pepper and molasses is valuable for coughs and colds. The volatile oil is given to stimulate the digestive juices in the stomach. As a poultice, it is recommended for inflammations. A tea of red pepper is used to promote perspiration in cases of colds and grip.

PUMPKIN

This is a pleasant and easily digested food. It should never be given raw. The vegetable is best boiled or made into pies. It is preferable to get a small pumpkin, as they are more nutritious.

Medicinal Properties.—Aside from its value as a food, the seeds of pumpkins are recommended for tapeworms. A tea is prepared from the dried seeds and sweetened; a teacupful is taken on an empty stomach. After four hours a dose of castor-oil is given, and the stools are examined for the worm. This tea is also valuable to tone up the stomach, especially in cases where there is vomiting after eating.

SPINACH

This vegetable is valuable because it can be mixed in with any diet. Its effect has become so evident that it should be used very extensively in all diets. It is best served as a boiled vegetable, and its nutritive value can be increased by the addition of hard-boiled eggs, which are chopped in with the spinach.

Medicinal Properties.—Spinach is valuable for all anemic conditions, especially those complicated by liver and intestinal disorders. It acts on the blood by forming new cells, and it has a mild laxative effect on the bowels. This vegetable is also recommended to purify the skin by increasing the general tone of the body. The juice of spinach is also said to whiten the skin when applied externally.

TOMATOES

This form of vegetable is very rich in acid substances, therefore those people who suffer from rheumatism or gout should avoid them. Tomatoes can be served in many forms, but they should not be eaten too frequently. The tomato is very healthful, but when canned ones are used, make sure that they have not decayed in the can.

Medicinal Properties.—The acids present in tomatoes are said to regulate the liver. The whole vegetable, when eaten raw, has a mild laxative action. Fever-sores in the mouth are relieved by sucking on half a tomato.

SYMPTOMATIC AND DIAGNOSTIC CHARTS

With the aid of the symptoms of the various diseases as given in the following pages, anyone can quickly determine the exact disease, and then by consulting the Index for the page on which that particular disease is described, full information regarding the ailment will be found.

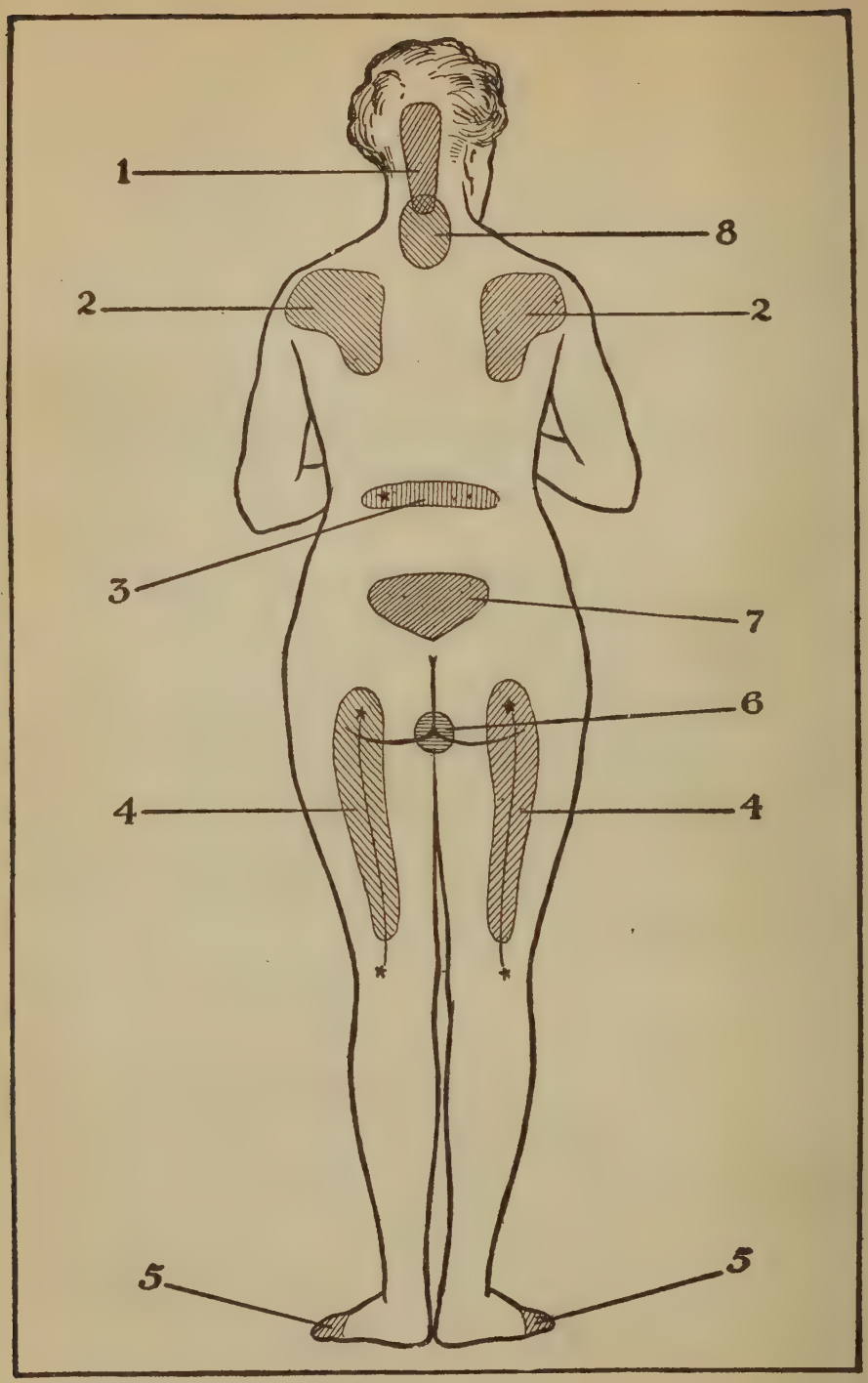


CHART 1

The shaded areas shown in the Chart on the opposite page indicate the location of the pain; the corresponding numbers on this page serve as a guide in determining the diseases most common to those parts.

CHART 1

1. Eye-strain.
   Neurasthenia.
   Affections of the womb.
   Meningitis.
   Affections of the cerebellum.
   Rheumatism.
   Spinal disease.
2. Right side:
   Aortic valvular disease.
   Aneurism.
   Liver diseases.
   Either side:
   Rheumatism.
   Neuritis.
   Neuralgia.
   Pleurisy (occasionally).
   Dilated stomach.
   Left side:
   Colitis.
   Pleurisy affecting the diaphragm.
3. Constipation.
   Gastric ulcer (frequently a specially tender point at *).
4. Sciatica (especially along the line of the nerve with particularly tender points at **).
   Affections of the rectum.
   If both sides:
   Probably some tumor in the pelvis.
   Locomotor ataxia.
   Diabetes.
5. Chilblains.
6. Piles.
   Anal fissure or fistula.
   Ischio-rectal abscess.
   Coccygeal neuralgia.
   Pruritus ani.
7. Affections of the reproductive organs, especially in women. ,,
   Sciatica.
   Diseases of the rectum.
   Piles.
   Hip-joint disease.
8. Same as 1. Also affections of the Heart. Very marked in cerebro-spinal meningitis.

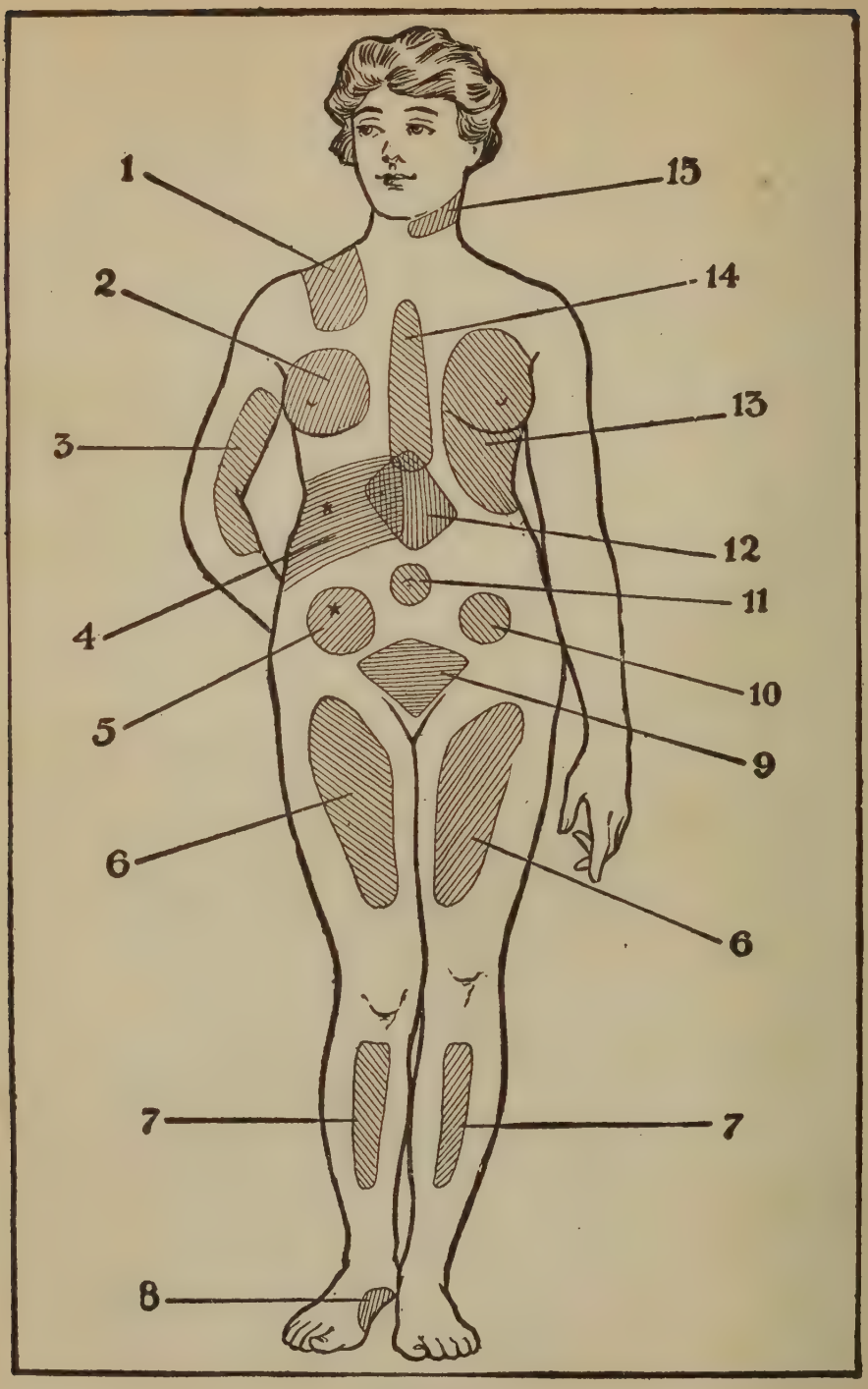


CHART 2

The shaded areas shown in the Chart on the opposite page indicate the location of the pain; the corresponding numbers on this page serve as a guide in determining the diseases most common to those parts.

CHART 2

1. Neuritis } either side.
   Neuralgia }
2. Affections of the breast.
   Pregnancy.
   Disease of the ovaries.
   Disease of the womb.
   Hysteria.
3. Rheumatism.
   Neuritis.
   Some diseases of the spinal cord (one or both arms).
   Affections of the spine (usually both arms).
   Angina pectoris (usually the left arm).
   Writer's cramp.
4. Diseases of the liver.
   Gall-stones or disease of gall-bladder (specially at ★).
   Pneumonia or pleurisy (may be even lower down, especially in children).
   Muscular fatigue.
   Cancer in the vicinity of the outlet of the stomach.
   Movable kidney.
   Valvular disease of the heart.
   Acute rheumatism.
5. Appendicitis (specially tender point at ★).
   Typhoid fever.
   Colitis.
   Hernia.
   Disease of the right ovary.
   Obstruction of the bowels.
6. Diseases of the ovary or womb (one or both sides).
   Neuralgia.
   Renal colic (one side).
   Psoas abscess.
   Inflamed glands in the groin.
   Abdominal tumors.
   Appendicitis (right side).
   Phlebitis.
7. Rheumatism.
   Bone disease.
   Phlebitis.
   Neuralgia.
   Neuritis.
8. Neuralgia.
   Flatfoot.
9. Affections of the bladder.
   Diseases of the ovaries or womb.
   Inflammation in the pelvis.
10. Colitis.
    Constipation.
    Hernia.
    Disease of the left ovary.
    Obstruction of the bowels.
11. Hernia.
    Ulcer of the stomach.
    Gall-stones.
    Spinal disease (at level of waist).
12. Stomach diseases.
    Irritant poisons.
    Duodenal ulcer and catarrh.
    Disease of the pancreas.
    Cholera.
    Rheumatism.
    Pneumonia or diaphragmatic pleurisy (in children especially).
13. Pleurisy.
    Pneumonia.
    Shingles.
    Neuralgia.
    Muscular rheumatism.
    Phthisis.
14. Heartburn or dyspepsia or other stomach diseases.
    Bronchitis.
    Aneurism of the aorta.
    Angina pectoris.
    Influenza.
    Growths in the chest.
    Bone disease (breast-bone or back-bone).
15. Tonsilitis.
    Sore throat.
    Pharyngitis.
    Laryngitis.
    Diphtheria.
    Scarlatina.
    Abscess.
    Cancer in the throat.
    Glands in the neck.

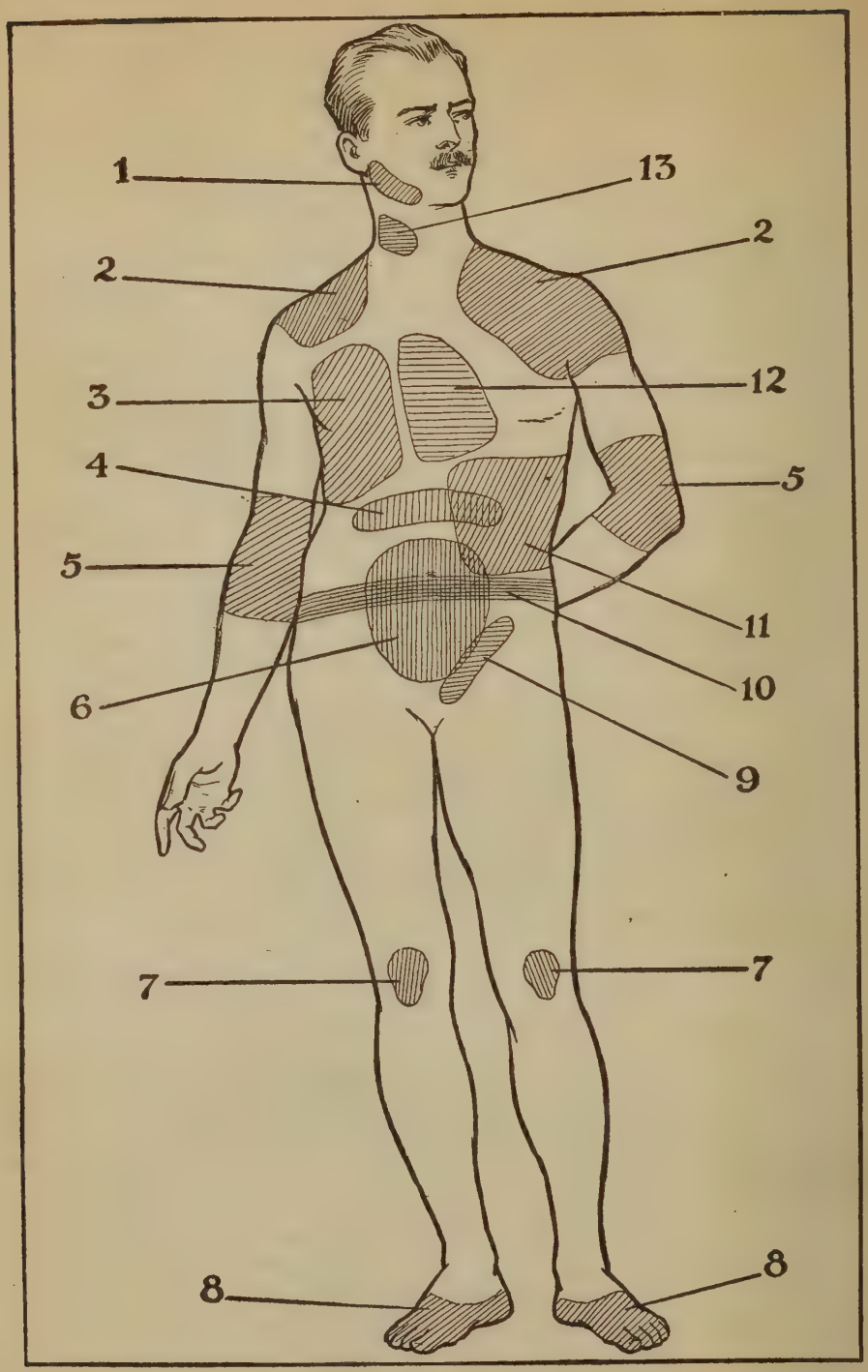


CHART 3

The shaded areas shown in the Chart on the opposite page indicate the location of the pain; the corresponding numbers on this page serve as a guide in determining the diseases most common to those parts.

CHART 3

1. Mumps.
   Toothache.
   Neuralgia.
   Disease of the lower jaw-bone.
   Actinomycosis.
2. Dilated stomach.
   Disorders of the large bowel.
   Neuritis.
   Neuralgia.
   Pleurisy (occasionally).
   Rheumatism.
3. Aneurism (if on left side).
   Flatulence (if on left side).
   Muscular rheumatism.
   Neuralgia.
   Pleurisy.
   Pneumonia.
   Phthisis.
   Pericarditis (if on left side).
   Shingles.
4. Pleurisy.
   Severe vomiting or coughing.
5. Muscular rheumatism.
   Neuritis.
6. Appendicitis (early stages).
   Colic.
   Cancer.
   Diffuse general abdominal pain, often colicky.
   Flatulence.
   Gastro-enteritis.
   Intestinal tuberculosis.
   Indigestion.
   Obstruction of the bowels from any cause.
   Peritonitis.
   Spinal disease and pneumonia (in children).
7. Loose cartilage.
   Disease of the knee-joint.
   Disease of the hip-joint.
8. Chilblains.
9. Constipation.
   Hernia.
   Mucous colitis.
   Renal colic.
   Varicocele.
10. Girdle sensation in affections of spinal cord.
11. Acute rheumatism.
    Colitis.
    Dilated stomach.
    Enlarged spleen.
    Gastric catarrh.
    Gastric ulcer.
    Gastric cancer.
    Movable kidney.
    Renal colic.
12. Anemia.
    Angina pectoris.
    Gastric catarrh.
    Gout.
    Palpitation.
    Various heart disorders and valvular disease.
13. Muscular rheumatism.
    Spinal disease (upper portion).
    Glands in the neck.

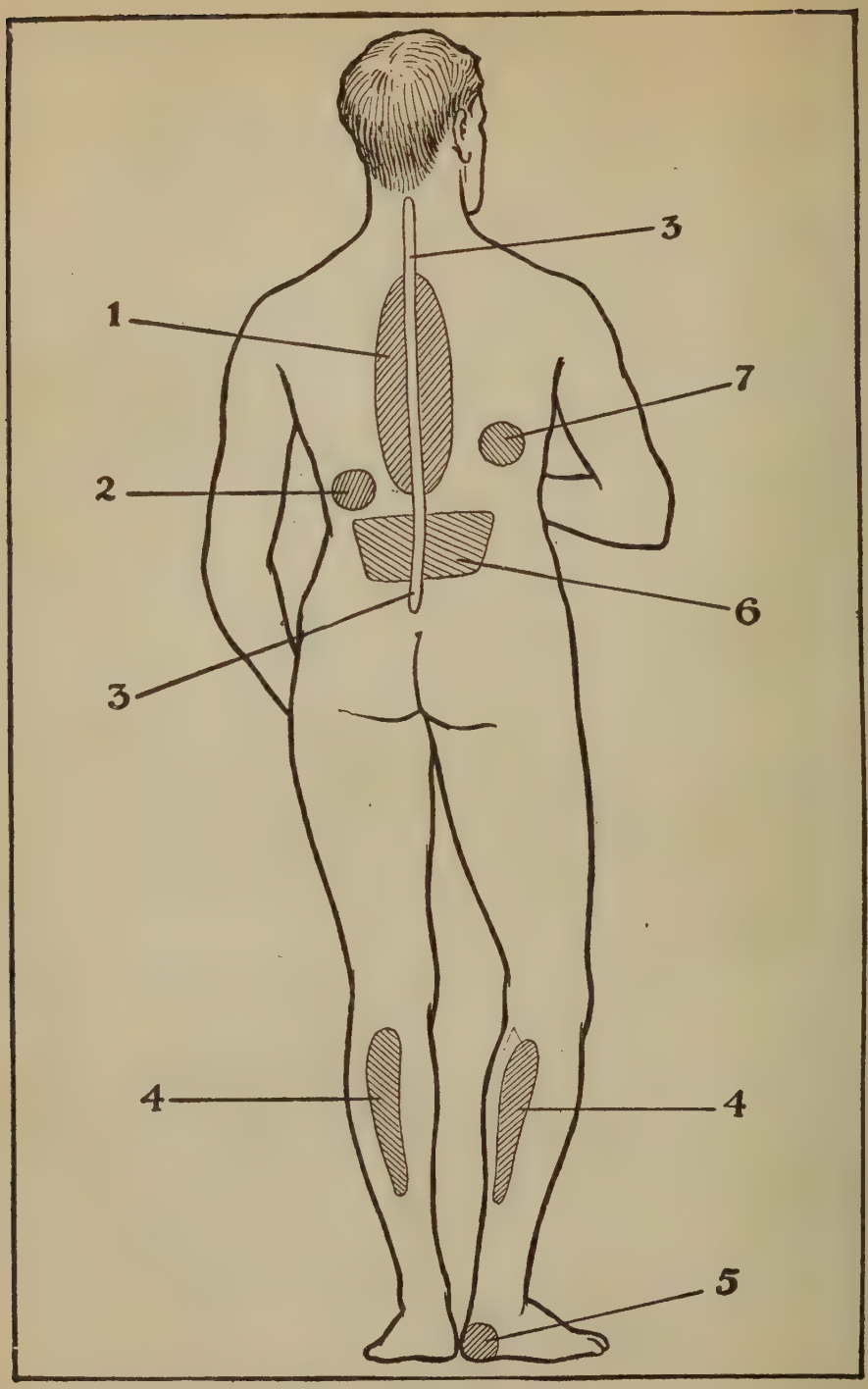


CHART 4

The shaded areas shown in the Chart on the opposite page indicate the location of the pain; the corresponding numbers on this page serve as a guide in determining the diseases most common to those parts.

CHART 4

1. Dilated stomach.
   Flatulence.
   Gastric ulcer.
   Acute gastric catarrh.
   Spinal disease.
   Rheumatism.
   Pancreatic diseases.
   Bronchitis.
   Pneumonia.
2. Affections of the spleen.
   Congestion of left lung.
   Flatulence.
   Muscular rheumatism.
3. Tenderness or pain at various points along the spine indicates:
   Diseases of the spine or spinal cord.
   Acute feverish diseases.
   Rickets.
   Hysteria.
   Neurasthenia (especially after accidents).
   Meningitis.
4. Cramp.
   Overexertion.
   Diabetes.
   Gout.
   Varicose veins.
   Neuritis.
   Rheumatism.
   Fallen arches.
   Acute infectious fevers.
5. Gout.
   Neurasthenia.
   Ovarian disease.
   Rheumatism.
   Weakness of the muscles of the foot.
   Deformity from shoes.
6. Lumbago.
   Any acute feverish disease, especially influenza.
   Smallpox.
   Dengue.
   Tonsilitis.
   Debility.
   Kidney diseases.
   Flatulence.
   Constipation.
   Rheumatism.
   Malposition of pelvic organs.
7. Frequently a specially tender point in liver diseases.
   Gall-stones.
   Ulcer of duodenum.
   Congestion of right lung.

Abdomen.—Distention; itching about anus; picking at nose; grinding teeth in sleep. **Worms.**

Abdomen.—Urination painful; pain in pubic region; painful discharge of urine; scanty, high-colored urine, sometimes bloody or containing pus; much straining is experienced, with possibly only a few drops as the result. **Cystitis (Inflammation of the Bladder).**

Abdomen.—Girdle pains around abdomen; pain on moving the muscles; constipation; usually fever sets in after one day. **Abdominal Neuralgia.**

Abdomen.—Excessive agony; increased by the least pressure or even the slightest touch; temperature high; pulse rapid and jerky; abdomen tense from swelling and legs drawn up to relieve pain; cheeks flushed, although skin is cold and clammy; face expresses agony. **Peritonitis (Inflammation of the Bowels).**

Abdomen.—Intense twisting pains in region from navel over abdomen; pain subdued by pressure; pain spasmodic; countenance expresses agony; pulse very slow; vomiting and nausea sometimes accompany the attacks. **Intestinal Colic.**

Anus.—Intense itching about anus; grinding teeth in sleep; sudden jerking of limbs in sleep. **Threadworms.**

Anus.—Irritation and itching about anus; feeling as of obstruction in rectum; a rather peculiar sickening feeling experienced during an evacuation; bleeding might also be present, and if this is excessive, it may afford temporary relief. **Piles (Hemorrhoids).**

Anus.—Projection of mucous lining of rectum after an evacuation. **Prolapse of the Anus, Falling of the Bowels.**

Anus.—Intense itching and pain about rectum, with a sense of fullness; general debility; formation of a fissure or crack in the skin at the anal opening; excessive pain while at stool; sometimes discharge of pus. **Fistula.**

Appetite.—Unnatural appetite; intense pain around navel region and continuing in an upward course, occurring before eating, and immediately relieved on partaking of food; debility; diarrhea; often nausea; occasional yellow discharge with stools or alone. **Tapeworm.**

Appetite.—Impaired, or loss of, in connection with general lack of energy; indigestion; pain in forehead; frequent discharge

from nostrils; hoarseness; frequent sneezing; dry cough. **Catarrh.**

Arms.—Pain beginning around shoulder and radiating down back of arm and occasionally becoming intense at elbow. **Neuritis.**

Arms.—Moving of arms causing pain in muscles; fever; loss of appetite; burning on urination. **Muscular Rheumatism.**

Back.—Hard, dry cough; pain behind breast-bone; slight feverishness; breathing somewhat wheezy; cough gradually becomes worse and patient brings up thick phlegm; slight loss of appetite and constipation. **Bronchitis.**

Back.—Feverishness; general discomfort; pain in back over region of kidneys; puffy, dropsical swelling under eyes; diminution in amount of urine with appearance of blood. **Bright's Disease.**

Back.—Pain in one loin, shooting down into bladder, and may radiate for a considerable distance along inner side of thigh; pain is exceedingly severe, accompanied with feeling of sickness, often vomiting; abdomen on affected side tender and rigid. **Stone in the Kidney.**

Back.—Frequent urination; pus and perhaps blood in urine; fever; dull, aching pain in loins, increased by pressure. **Inflammation of the Kidneys.**

Back.—Pain and stiffness in muscles of small of back; attack comes on suddenly after exposure to cold, or after exercise in which stooping has been necessary; one or both sides of back may be affected; sneezing or coughing is also painful to patient. **Lumbago, Muscular Rheumatism.**

Back.—Feeling of weight or dragging pain in side; colicky abdominal pains; frequently indigestion; colicky pains shooting down into groin and inner side of thigh; nervousness; hysteria; relief obtained while lying down. **Floating or Movable Kidney.**

Bowels.—Loss of appetite; general illness; griping pains in abdomen; diarrhea; discharges gradually become scanty, mucous, and slimy, mixed with blood and of offensive odor; later feverishness; great depression; thirst; scanty and painful urination. **Dysentery.**

Bowels.—Irregular motions; costiveness; griping pains, mostly spasmodic; high temperature; nervousness; rapid high pulse. **Inflammation of the Bowels.**

Bowels.—Diarrhea of violent character; evacuation of large quantities of semi-solid material, gradually becoming watery; sinking feeling in pit of stomach; intense cramps; vomiting; headache. **Cholera Morbus.**

Bowels.—Abdomen tender to touch; fever; thirst; diarrhea; general weakness. **Cholera Infantum.**

Breast.—Painful area around the breast is a troublesome condition of pregnancy.

Breathing.—Short and sudden paroxysms of breathing, generally at night or early morning; respiration performed with great difficulty, accompanied by wheezing noises; countenance pale or livid; extremities cold; pulse rapid. **Asthma.**

Breathing.—Rapid breathing; anemia; loss of appetite and strength; cough; night-sweats; fever. **Consumption.**

Breathing.—Sharp pain in the side when inhaling; sometimes fever; quick, unnatural breathing; sometimes sharp stabbing pain as high as region of breast, and may extend to shoulder in back; painful cough with expectoration; thirst; urine scanty and high colored. **Pleurisy.**

Breathing.—Attack comes on suddenly with feeling of chilliness, and sometimes shivering fits; severe pain in side; temperature rises rapidly; pulse full and bounding, face flushed; small blisters on lips; short painful cough; expectoration rusty in color; headache; loss of appetite. **Pneumonia.**

Chest.—Pain on right side in region of liver; backward congestion in veins of stomach, which develops into chronic gastric catarrh; vomiting; black, bloody stools; feet swollen. **Cirrhosis (Gin-Drinker's Liver).**

Chest.—Hard, dry cough, with pain behind breast-bone; feverishness; breathing somewhat wheezy; cough becomes worse with expectoration. **Broncho-Pneumonia.**

Constipation.—One of the characteristic symptoms of constipation is pain in the abdomen. Gas usually distends the large bowel, causing the pain.

Cough.—Short, dry cough; some feverishness; general debility; slight cold in head; cough occurs in paroxysms of a series of short, sharp barks, preventing air entering lungs, which causes face to become purple; long, violent inspiration, causing a crowing sound, or the "whoop"; expectoration sticky, mucous. **Whooping-Cough.**

Cough.—Breathing hoarse and croaky; difficult at night; voice thin; cough paroxysmal and metallic in tone; pallor; sweating; struggling for breath. **Croup.**

Ears.—Cracked condition of skin; watery discharge and intense irritation. **Eczema,** acute in infants; chronic in rheumatic adults.

Ears.—Swelling and tenderness of skin behind ear; redness and swelling inside ear; pain on side of head; feverishness; discharge of foul-smelling brownish material. **Inflammation of Ear, Mastoid Disease.**

Expectoration.—Thick, sticky sputum, speckled with black, owing to dust inhaled and deposited in throat; a watery, inflammatory condition of the throat. **Catarrh.**

Expectoration.—Watery, frothy, and brought up in considerable quantities during an attack of coughing. **Bronchitis.**

Expectoration.—Sputum with rusty tinge and so sticky that it adheres to dish into which it is spat when turned upside down. **Pneumonia.**

Expectoration.—Bright red, frothy blood brought up from lungs in large quantities during coughing. **Consumption, Hemorrhage from the Lungs.**

Expectoration.—Dark brown blood brought up by vomiting. **Ulcerated Stomach, Hemorrhage of Stomach.**

Face.—Discoloration of skin; considerable itchiness; yellow discoloration of white of eyes; vomiting; considerable nausea. **Jaundice.**

Face.—Aching, shooting, or tingling pains between eye and lower jaw on either side of face; loss of feeling in skin; twitching of muscles of face. **Neuralgia.**

Face.—Swelling and pain in front of ear; sore throat; headache; general discomfort; temperature rises, with aching pains on one side, quickly spreading to the other. **Mumps.**

Fever.—Headache; feeling of general wretchedness, followed by feeling of cold or chills; face pinched; skin cold; temperature growing higher all the time; possibly vomiting. **Malarial Fever.**

Fever.—Sudden rise in temperature; weary and tired feeling; pains in back and limbs; headache; tongue coated at back and down the middle; cheeks flushed; lips dry and parched; urine meager and high colored. **Typhoid Fever.**

Fever.—Headache; pains all over body; feeling of chilliness; rigors; temperature rises rapidly; tongue dry and brown. **Typhus Fever.**

Fever.—Sudden feeling of coldness; sometimes shivering attacks; severe headache; pains in back and limbs; face flushed; temperature rising; pulse rapid and bounding; loss of appetite; vomiting; urine diminished, and contains albumin; jaundice; severe prostration. **Yellow Fever.**

Fever.—Sudden feeling of illness; rigors; vomiting; sore throat; rapid rise in temperature and increase in pulse; eruption on neck, chest, arms, hands, quickly spreading all over body; and consists of thickly set red spots, some containing small vesicles of fluid; tongue furred; throat red and swollen. **Scarlet Fever.**

Fever.—Feverishness; headache; severe pains in back; vomiting; red rash on the trunk, gradually becoming hard, shot-like pimples over more or less of the body; third day pimples become little vesicles about size of a pea; seventh or eighth day fluid changes into pus. **Smallpox.**

Fever.—Fever slight; eruption on body spreads rapidly, vesicles containing water in clusters on body and scalp. **Chicken-pox.**

Head.—Feeling of languor; sleepiness; discoloration of eyes and skin; uneasiness about region of stomach. **Biliousness.**

Head.—Severe pain; redness of eyes; constipation; dry skin; face flushed; ringing in ears; nosebleed. **Brain Fever.**

Head.—Unnaturally large, square in outline, but flat on top; bones of skull thin and crackle under pressure of the fingers; nervousness; restlessness at night; sometimes convulsions. **Rickets.**

Head.—Sharp radiating pains in back of head, sometimes also on top; nervousness; loss of appetite; occurring periodically with menstrual periods. **Diseases of Ovaries and Pelvic Organs.**

Heart.—Shortness of breath; palpitation, with bounding pulse; breathlessness increases so that patient cannot lie down in comfort; severe pain around region of heart. **Angina Pectoris (Neuralgia of the Heart).**

Heart.—Severe pain over region of heart; feverishness; feeble, rapid, and often irregular pulse; inconstant breathing. **Pericarditis.**

Heart.—Patient feverish; shivering fits; copious sweating; prostration; distressing breathlessness; sometimes delirium; development of abscesses in various parts of body, caused by parts of ulcerating valve breaking off and being carried away in blood-stream. **Endocarditis.**

Heart.—Irregular, slow pulse; heart-beats not perceptible; dizziness; faintness; indigestion; difficult breathing; cold hands and feet; weak muscular power. **Fatty Degeneration of the Heart.**

Inflammation of Skin.—Bright rose-red rash on face, accompanied by chill, headache, general discomfort; parts affected are swollen; blisters containing pus or watery substance gradually appear. **Erysipelas.**

Itching.—Around anus; offensive breath; loss of appetite; straining at stool; sleeplessness. **Worms.**

Itching.—On backs of hands and between fingers; small, pointed vesicles appear on the parts, which must be eradicated at once to prevent spreading; excessive itching at night, which is almost unbearable. **Scabies.**

Joint.—Swollen and acutely inflamed; extreme pain caused by movement or touch; skin over joint dusky red, sodden in appearance, and much hotter to touch than surrounding parts; profuse sweating; coated tongue; urine scanty and high colored. **Chronic Rheumatism.**

Joint.—Stiffness of hip; swelling of the part, with great distress; redness; lameness, with wasting of muscles about hip and leg. **Hip Disease.**

Kidney.—Dragging feeling in side; colicky abdominal pains; intense colicky pains on one side, shooting down into groin and inner side of thigh; uneasiness in the lumbar region; indigestion; nervousness. **Floating Kidney.**

Kidney.—Pain in one loin, shooting down into bladder, and radiating along inner side of thigh; preceding the pain, feeling of sickness with vomiting; abdomen on affected side tender and rigid; temperature high; constant desire to pass water, although only small quantities are passed, containing blood. **Stone in the Kidney (Gravel).**

Kidney.—Frequent urination; pus and perhaps blood in urine; fever; rigors; dull aching pain in loins, increased by pressure over that region. **Suppuration in the Kidney.**

Legs.—Pain beginning in loin and radiating down back of thigh, accompanied by tenderness over whole area; urinary symptoms showing acidity of urine. **Sciatica.**

Legs.—Stiffness of muscles; inability to walk; fever and loss of appetite. **Muscular Rheumatism.**

Liver.—Fever of an irregular or intermittent type; general weakness; loss of strength; dyspepsia; enlargement of liver so it can be felt well below margin of ribs; attacks of pain under lower ribs on right side; also pain through back in region of right shoulder-blade. **Abscess of the Liver.**

Liver.—Chronic gastric catarrh; indigestion; feeling of discomfort in pit of stomach; morning sickness; hemorrhage into stomach and vomiting of blood; blood in stools, giving them a black, tarry appearance; distention of the abdomen. **Cirrhosis of the Liver.**

Liver.—Enlargement of liver so that it may stand out prominently below ribs on right side; also nodules of tumor can often be felt through abdominal wall; emaciation is present and sometimes jaundice. **Tumors of the Liver.**

Menstruation.—Sharp, cramp-like pains coming on in paroxysms, lasting a minute or two and recurring at short intervals; nervousness; anemia; constipation. **Painful Menstruation (Dysmenorrhea).**

Menstruation.—Irregular periods, with little or no flow of blood; anemia; sometimes pain is present, also headache; nervousness; flushing at time when menstruation is expected. **Amenorrhea; Absent Menstruation.**

Menstruation.—Profuse bleeding, lasting either too long or coming too freely, or repeating at too short intervals; severe spasmodic headache during periods. **Profuse Menstruation (Menorrhagia).**

Menstruation.—Irregularity in menstrual periods; often cessation of flow as early as forty years of age; sleeplessness; nervous headache; disorders of digestive system; nervousness; often affections of the mind. **Change of Life (Menopause).**

Mouth.—Tongue coated; bad breath; headache, with general heavy feeling; dizziness. **Biliousness.**

Mouth.—Uneasy, distressing feeling in stomach, accompanied with belching, bringing water or food to the mouth. **Heartburn.**

Mouth.—Redness inside of mouth, pain; excessive flow of saliva; diarrhea; painful mastication. **Stomatitis.**

Mouth.—Malnutrition; gums of lower jaw swollen, red, and spongy; teeth become loosened; increased flow of saliva; offensive breath. **Ulcerated Mouth, Ulcerated Stomatitis, Putrid Sore Mouth.**

Mouth.—Feeling of discomfort in mouth as in inflammation; white, pearly specks like milk-curd grow rapidly and form into a membrane which can be pulled off, looking like pieces of soiled blotting-paper, leaving a slightly raw, bleeding surface. **Thrush, Sprue.**

Nausea.—Vomiting; excessive heat of body, preceded by chills; strong pulse; dry tongue; short breaths; desire to lie flat on back with feet drawn up. **Inflammation of the Stomach.**

Neck.—Sudden muscular twitching on one side of neck, followed by painful moving of head, accompanied by headache localized to back of head. **Stiff Neck.**

Neck.—Pain on both sides of neck below angles of jaw; fever; loss of appetite; painful swallowing of food. **Tonsilitis.**

Neuralgia.—Aching, shooting or tingling pains between eye and lower jaw on either side of face; loss of feeling in skin; twitching of muscles of face. **Facial Neuralgia.**

Nose.—Excessive discharge; fits of sneezing; running from eyes and nostrils; sometimes bad headaches; occasional wheezy, difficult breathing; tightness on chest. **Hay Fever.**

Nose.—Offensive discharge; sneezing; sore throat; irritation along nasal passage to head; pain in forehead; mucous discharge from mouth and nose. **Catarrh.**

Ovaries.—Aching feeling low down in abdomen, which may become chronic; may be only on one side, but usually on both sides; sensitive to touch; tenderness under skin; pain before menstrual period. **Inflammation of the Ovaries.**

Ovaries.—One side of abdomen appears larger than the other; a lump may also be felt on same side, which increases in size; later entire abdomen becomes swollen, and often mistaken for signs of pregnancy; evacuations from bowels become painful and urination irritable; later legs swell; shortness of breath; pain more constant and severe. **Tumors of the Ovary.**

Pain.—Griping pains in abdomen; loss of appetite; diarrhea, increasing in severity; discharges from bowels become very fre-

quent; painful feeling of downward pressure becomes so intense that patient has constant desire to go to stool; discharges become slimy, mucous, and mixed with blood. **Dysentery.**

Pain.—Violent pains in center of abdomen; vomiting; bowels hot and tender to slightest pressure; gums blue; diarrhea. **Painter's Colic, Lead Colic.**

Pain.—In right side and shoulder; bowels irregular; furred tongue; high temperature; dizziness. **Liver Complaint.**

Pain.—Dull pain in forehead; feeling of heat in nostrils; irritating discharge from nose; dry cough; loss of appetite. **Catarrh.**

Pain.—Pain in abdomen of a severe and sickening character; extreme tenderness of abdomen, aggravated by slightest pressure; breathing rapid and shallow; costiveness; high temperature; scanty urine; belching; bilious vomiting. **Peritonitis.**

Pain.—Sudden and severe pain about region of heart, extending over chest, shoulder, and down the arm; weakness; cold perspiration. **Heart Disease.**

Pain.—Pain in throat when swallowing; thirst; swollen tonsils; general discomfort; pain in back and legs. **Quinsy.**

Pain.—Severe pain in side, of a stabbing character, accompanied by cough and greatly aggravated by breathing; pain extends to shoulder and front of chest; chills and rising temperature. **Pleurisy.**

Pain.—Persistent headache and pain in head of a dull, throbbing character; sense of fullness in head; vomiting; giddiness; noises in ears; slight confusion of mind; numbness of a limb or one side of body. **Apoplexy.**

Pain.—Pain in chest; impaired digestion; loss of appetite; great thirst; nausea; furred tongue; cough, especially in early morning; night-sweats; debility. **Consumption.**

Pain.—Severe pains in limbs, also soreness; headaches; body hot, extremities cold; severe diarrhea. **Typhoid Fever.**

Pain.—Pain in side, between breast-bone and shoulder-blade; high temperature; pulse quickened; breathing rapid; hacking cough; expectoration. **Pneumonia.**

Pain.—Acute pain in joints, usually intermittent, more severe at night; redness and swelling of joints; inflammation. **Acute Rheumatism.**

Pain.—Pain in stomach, back, and limbs; rise of temperature; furred tongue; constipation; vomiting; delirium; eyes red and watery. **Spotted Fever, Yellow Fever.**

Pain.—Shooting and tingling pains between eye and lower jaw on either side of face; loss of feeling in skin; twitching of muscles of face. **Neuralgia.**

Perspiration.—Clammy, cold, accompanied by general lassitude; tongue furred; nausea; labored breathing. **Typhus Fever.**

Respiration.—Oppressed breathing with wheezing cough; tightness on chest. **Bronchitis.**

Respiration.—Hoarse and croaky breathing; voice thin; sweating; struggling for breath. **Croup.**

Ringing in the Ears.—Severe headache; red, watery eyes; flushed face; costiveness; fever; mind disturbed. **Meningitis.**

Ringing in the Ears.—Shortness of breath; irregular pulse; cough; sleeplessness. **Enlargement of the Heart.**

Shoulder.—Pain radiating down arm and increased with movement of shoulder, with fever and severe headache. **Rheumatism of the Joint.**

Side.—Stitch in the side, developing into a pain and extending up to shoulder-blade and front of chest; usually preceded by a chill and followed by fever and thirst. **Pleurisy.**

Side.—Severe pain in side between breast-bone and shoulder-blade; rising temperature; quickened pulse; rapid breathing; hacking cough; expectoration. **Pneumonia.**

Skin.—Discoloration of skin; considerable itchiness; yellow discoloration of white of eyes; vomiting; nausea. **Jaundice.**

Skin.—Inflammatory condition of skin, characterized by scaly and fissured condition of cuticle, accompanied by sticky, watery discharge, with considerable itching or even pain. **Eczema.**

Skin.—Bright red rose-rash on face, accompanied by chill; headaches; general discomfort; skin blistered in part affected, and also swollen. **Erysipelas.**

Skin.—Very itchy and irritable; development of raised white "wheals," or white and red patches, over whole or part of body; occurring usually in hot weather. **Hives (Nettle Rash).**

Skin.—Pimples and blackheads appearing on face, containing small amount of pus; occurring usually during time of maturity, and more commonly in males than females. **Acne.**

Skin.—Yellowish color; headache; coated tongue; sleeplessness. **Biliousness.**

Skin.—Discoloration of skin from dark red to purple; hard lump under skin, hot to touch. **Carbuncle.**

Sneezing.—Severe cold in head; excessive fits of sneezing; running eyes and nostrils; headache; wheezy, difficult breathing. **Hay Fever.**

Sneezing.—Fits of sneezing, accompanied with a profuse watery discharge from nostrils and eyes; feeling of weight in forehead; sense of taste and smell often impaired. **Catarrh.**

Sore Throat.—Severe pain, especially when swallowing; ache in neck; pharynx swollen and red. **Acute Pharyngitis.**

Sore Throat.—With stiffness and dryness; a sensation as though some foreign body were there which leads to coughing; when speaking, voice is husky. **Chronic Pharyngitis.**

Sore Throat.—Husky voice; sometimes complete loss of voice; painful when speaking; cough dry and hard; usually painful when swallowing food. **Acute Laryngitis.**

Sore Throat.—Accompanied with cough; running nose; watery, congested eyes; fever; occasional bleeding from nose; slight eruption of skin. **Measles.**

Sore Throat.—Fever; dry mouth; chills; aching limbs. **Diphtheria.**

Stomach.—Discomfort in pit of stomach; may become very severe; nausea; vomiting; tongue furred; breath offensive; loss of appetite; great thirst; headache. **Acute Dyspepsia, Acute Gastric Catarrh.**

Stomach.—Pain in upper part of abdomen; considerably aggravated when food is taken; pain at lower end of breast-bone, sometimes in back between shoulder-blades; vomiting of blood. **Ulcer of Stomach (Gastric Ulcer).**

Stomach.—Aching, gnawing pain in region of stomach, shooting through to back; indigestion; inability to retain food; emaciation; loss of weight and strength; vomiting some blood. **Cancer of Stomach (Early Stages).**

Stomach.—Discomfort and feeling of weight in upper part of abdomen; belching of offensive gas, caused by fermentation of contents of stomach; excessive vomiting; patient becomes thin; muddy, sickly yellow discoloration of skin. **Dilatation of the Stomach.**

Stomach.—Pain in stomach; great thirst; mind disturbed; eyes red and watery; skin hot and yellow; labored breathing; furred tongue. **Yellow Fever.**

Swelling.—Stiffness of the hip; abnormal attitude of the limb; lameness; wasting of muscles about hip and leg, and pain. **Hip-joint Disease.**

Swelling.—On forepart of neck; or on one side of neck, but usually on both; not painful until it becomes so large as to press against the windpipe or gullet and affects breathing or swallowing. **Goiter.**

Tongue.—Flabby, indented tongue, with uniform brownish fur. **Catarrh of the Stomach.**

Tongue.—Covered with white fur and red spots, known as "strawberry-tongue": seen early in **Scarlet Fever.**

Tongue.—Fissured down center, furred along edges of fissures, while tip and edges are red. **Typhoid Fever.**

Urine.—Constant desire to pass urine, resulting only in small quantities; pain in one loin, shooting down into bladder; abdomen on affected side tender. **Stone in the Kidney (Gravel).**

Urine.—Frequent urination; pus and blood in urine; fever; dull, aching pain in the loins. **Suppuration in the Kidney.**

Urine.—Scanty urine, with appearance of blood; puffy swelling under eyes; feverishness; general discomfort; pain in back over kidneys. **Acute Bright's Disease.**

Urine.—Urine scanty at first, later considerably increased in quantity; vomiting and diarrhea; pale and puffy countenance; urine contains much albumin and possibly blood. **Chronic Bright's Disease.**

Urine.—Yellowish-brown or greenish-brown urine; discoloration of skin and whites of eyes; constipation; stools clay color. **Jaundice.**

Vagina.—Offensive discharge, either acute or chronic, causing general discomfort. **Leucorrhea.**

Vagina.—Excessive itching and burning in the parts; backache; pain in pelvis; nausea; loss of appetite. **Vaginitis.**

Vagina.—Hemorrhage caused by excessive straining at stool; offensive discharge. **Malignant Tumor of the Vagina.**

Vomiting.—Excessive vomiting of large quantities of fermented contents of stomach; belching of offensive gas; discomfort. **Dilatation of the Stomach.**

Vomiting.—Accompanied by severe pain; discomfort in pit of stomach; offensive breath; loss of appetite. **Acute Gastric Catarrh.**

Vomiting.—With bile; white tongue; thirst; pains in head and back. **Bilious Fever.**

Vomiting.—Bile; urine discolored; strong pulse; thirst; constipation; shooting pains through bowels. **Inflammation of the Bowels.**

Vulva.—Swelling, redness, heat, dryness, and itching of the parts; leucorrhea indicated by a creamy discharge, preceded by a thin, watery one; burning sensation; frequent desire to urinate. **Inflammation of the Vulva (Vulvitis).**

Vulva.—Part affected covered with pimples and blisters which break, leaving a raw surface; painful bowel movements; weakness in legs. **Herpes of the Vulva.**

Vulva.—Bleeding and discoloration of the parts; general health poor; loss of appetite; ulceration of part affected. **Gangrene of the Vulva.**

Womb.—Excessive hemorrhage at menstrual periods; very often bloody discharges between the regular periods; leucorrheal discharges containing blood; general debility; occasional pain in region of the womb. **Polypus or Tumor of Womb.**

Womb.—Neck of womb becomes swollen and large, and by reason of its increased weight causes displacement; inflammation precedes ulceration; discharge of pus and glairy transparent mucus similar to white of an egg; pains in loins and lower part of abdomen; irregular menstruation. **Ulceration of Neck of Womb.**

Womb.—A more or less bearing-down or dragging sensation is felt in the lower part of the abdomen, with dull pain in the small of the back; a sense of fullness around the rectum, with pressure low down toward the privates; leucorrhea; pain in groin; headache; dragging pain in the nape of the neck. **Prolapse of the Womb.**

Womb.—Sense of weight and dragging pain in small of back, extending to the front and down the thighs; leucorrhea; painful menses; burning and itching feeling in vagina; white, yellow, or bloody discharge from vagina. **Endometritis (Inflammation of the Lining Membrane of the Womb).**

Womb.—Severe pains in lower part of abdomen; weight in

pelvis; fever; constant nausea; painful stool. **Metritis (Acute Inflammation of the Womb).**

Womb.—Dull, deep-seated pain in lower part of abdomen, just below pubic bone; constant pain in loins and region of sacrum, extending down to inside of thighs; pains increased by walking; oppressive feeling of weight in region of pelvis. **Chronic Metritis.**

Womb.—Menstruation meager or entirely absent; womb becomes congested; nausea; fainting; pain low down in abdomen, with frequent desire to urinate. **Anteflexion of the Womb.**

Womb.—Frequent miscarriages; leucorrhea; dragging pains in the abdomen; constipation; painful menstruation. **Anteversion of the Womb.**

Womb.—Dragging pains in the thighs and lower part of the abdomen; painful menstruation on first or second day of flow; dull aching pain in small of back; leucorrhea; costiveness; abortions; escape of urine from violent exercise or emotion. **Retroflexion of the Womb.**

Womb.—Frequent miscarriages; leucorrheal discharges; frequent pains in the lower part of the abdomen; headache; constipation. **Retroversion of the Womb.**

Womb.—Feeling of weight and discomfort; dragging pain in pelvis; irritability of bladder; bleeding from least exertion; disorders of stomach; loss of appetite. **Subinvolution of the Womb.**

Womb.—Shooting, stabbing pains, radiating from the center of the pelvis to the lower portion of the back and groin, extending down the inner side of the thighs; pains aggravated by walking or standing but relieved upon lying down; offensive leucorrheal discharges containing blood and gangrenous matter. **Cancer of the Womb.**

Yellowness.—First appearing in the whites of the eyes and later over the whole skin; urine of a dark greenish-brown color; indigestion is present; tongue furred; appetite poor; stools gray or white; bitter taste; uncomfortable itching of the skin. **Jaundice.**

Yellowness of complexion, accompanied by discomfort of abdomen; furred tongue; loss of appetite; vomiting of bile and looseness of bowels; headache; languor. **Congestion of the Liver.**

Name	Incubation period after infection and before illness begins	Day after illness begins on which the eruption appears
Chicken-pox	10 to 16 days	1st day and 3 following days.
Cholera	A few hours to 10 days, usually 3 to 6 days	
Consumption		
Diphtheria	2 to 10 days	Membrane appears in throat on 1st or 2d day
Erysipelas	3 to 10 days	1st day
Liberty (German) measles	7 to 18 days, or even longer	2d to 4th day
Spanish influenza	1 to 4 days, usually 3 to 4 days	
Measles	10 to 14 days	4th day. The patient is highly infectious for 2 days before the rash appears
Mumps	10 to 22 days	
Plague	2 to 8 days; in rare cases, up to 15 days	
Scarlet fever	1 to 8 days; usually 3 to 5 days	2d day
Smallpox	12 to 14 days	3d or 4th day
Typhoid (enteric) fever	7 to 21 days; usually 10 to 14 days	8th or 9th day
Typhus fever	5 to 14 days; very variable	5th day
Whooping-cough	7 to 14 days	The characteristic whooping may not appear for 2 or 3 weeks, although the patient is infectious before then
Yellow fever	3 to 6 days (in mosquito, 12 days after biting patient)	

Day after illness begins on which the eruption fades	Symptoms	Isolation period required after the latest exposure to infection
About 4th day	Headache; irregular fever; rash on body in form of blisters, which appear first on face and chest.	20 days
	Severe diarrhea; marked weakness; suppression of urine; marked thirst; occasional abdominal pain which leads to vomiting.	12 days
	Cough; worse at night; pain in chest; fever every afternoon, and night sweats.	
	Sore throat; loss of appetite; high fever; weakness; patches in throat.	12 days
	Affects head and neck; skin becomes red and painful; fever sets in, with severe headache.	12 days
4th to 7th day	Sore throat; fever; cold in head; running eyes and nose; bright red rash spreading rapidly over body.	20 days
	Cough; sore throat; pains all over body; marked weakness; temperature irregular.	5 days
5th to 7th day	Cold in head; fever; red eyes; persistent sneezing; rash appears as small, red pimples.	16 days
	Loss of appetite; headache; swelling in front of ear; also fever.	24 days
	Headache; constipation; high fever with marked weakness; noises in the head, and eyes are bright red.	21 days
5th day	Chills; headache; coated tongue; quick pulse; fever; bright red eruption.	10 days
9th or 10th day	Vomiting; pain in back; flushed face; chills and fever.	16 days
21st day	Diarrhea; headache; coated tongue; loss of appetite; abdominal pains; high fever.	23 days
14th day	Marked chills; headache; weakness; high fever; loss of appetite.	14 days
	Vomiting; continuous spitting; pains in nose and ears; persistent cough, followed by whooping noise.	21 days
	Intense fever; headache; weakness; skin like bronze; backache; vomiting.	7 days

DIAGNOSTIC TABLE OF
DISEASES OF LUNGS, PLEURÆ, AND BRONCHI

Name	Causes	Symptoms	Duration
Acute bronchitis	Cold; measles; typhoid; gout; diabetes.	Cold in head; chills; cough; sore throat; voice may be lost.	Usually 3 to 5 days; if neglected, may persist.
Chronic bronchitis	Bad air with dust; poor heart; bad kidneys; rheumatism.	Weakness; pain in chest; rapid breathing; weak voice.	Months or years, if not attended to.
Bronchial asthma	Nervousness; kidney and stomach trouble; also peculiar odors.	Pale complexion; fever and sweats; cough brings up round masses of gelatine.	Attacks usually last about half an hour, or may last over an hour.
Enlarged bronchial glands	Tuberculosis; neglected coughs; syphilis.	Dry cough; weakness; blue skin; rapid breathing.	Years.
Influenza of lungs	Exposure to dust of metals; neglected cough; poor health.	Weakness; fever; distended chest; dry cough.	About 1 to 2 weeks.
Acute pleurisy	Tuberculosis; pneumonia; syphilis; typhoid; kidney diseases.	Pale face; rapid breathing; chilly feeling; fever.	10 days.
Chronic pleurisy	Tuberculosis; poor health; neglected pneumonia.	Sweating one side of face; irregular breathing and gradual weakness.	Months.
Croup	Catarrh of nose; enlarged tonsils; catching cold; neglected cold.	Redness of throat; slight fever; convulsions; face dark red during attacks; loud and ringing cough.	Several weeks.
Lobar pneumonia	Infection by germ; old age; typhoid; alcoholism; diabetes.	Chills; rapid rise in temperature; pain in chest; bad cough.	2 weeks.
Broncho-pneumonia	Infectious fevers; diarrhea; neglected bronchitis.	Blue skin; rapid breathing; hard and distressing cough, with fever.	10 days.
Passive congestion of lungs	Weakness; bad heart; kidney diseases; tumors.	No fever; weak pulse; difficult breathing; inability to sleep.	Months.

MISCELLANEOUS

HEADACHE

HEADACHE is a condition of great importance, because it not only appears in very varied types of persons from many different causes, but it sometimes is so constant or so severe as to occasion great distress and interference with the ordinary duties of life. In children particularly, recurring headache should not be lightly regarded, because it may, on the one hand, be the first symptom of some serious organic disease, or, on the other hand, its cause may be one which at this early stage is easily removed, though, if the defect be allowed to remain, it and the headache may become permanent. Headache is oftenest due to some condition of the brain, and the great fluctuations in size and amount of contained blood which the vessels of the brain constantly undergo, coupled with the fact that the rigid skull allows only very slight changes in the volume of its contents, bulk very largely in the cause of many headaches. Often, however, the skull, the scalp, the nerves of the head and face, or the membranes of the brain constitute the real seat of pain.

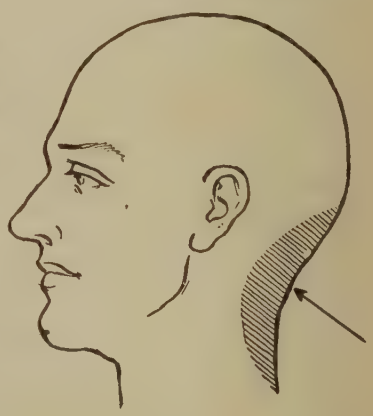
Nervous Headache is one of the most severe types. It affects, in general, persons of a nervous temperament in whose family various nervous diseases, like epilepsy, hysteria, insanity, are found, and is apt to occur at times when the general health is poor, when the mind has been occupied by severe business worry, or brooding over some unpleasant thought. These headaches are also associated with the hurry and noise of city life, disappearing very quickly on a change to country residence, and in many people they appear to depend upon electrical changes of the atmosphere. In women, severe nervous headache associated with pains and flushings in various parts of the body may be a sign of the approach of the menopause (change of life). *Clavus,*

a pain as of a nail being bored into some part of the forehead, usually in the region as indicated by the shaded area on the accompanying illustration, is one form taken by nervous headache, generally attributed to neuralgia.

Treatment.—A hot bath and a mustard plaster applied to the back of the neck will be found very beneficial.

℞ Tincture of
Valerian . . . two tablespoonfuls
Dose: One teaspoonful in water every three hours when necessary.

Anemic Headache occurs in girls and others who suffer from general anemia; in persons who have any form of heart disease, which prevents the brain from getting its full supply of blood; in the subjects of Bright's disease; and, above all, in old people whose arteries are thick and narrow, and in whom it comes on especially at night in association with insomnia. This type of headache is generally in the back of the head as shown by the shaded area in the accompanying illustration, and is very often worse when the sufferer stands or walks about, but relieved when he lies down.



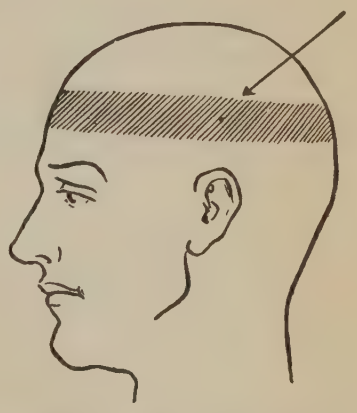
The special symptoms of this headache are depression of spirits, irritability of temper, timid fear of events not likely to happen, sometimes sleeplessness, but sometimes also drowsiness during the day, when the person should be awake, and very often coldness of the hands and feet with pallor of the face. There is, for persons subject to this type of headache, a great liability to contract the alcoholic habit, because alcohol gives great temporary relief.

Treatment.—Iron and good food are necessary in some cases, cardiac stimulants in those where the heart is feeble. In other persons the stoppage of any weakening discharge which may be present, and in old people the use of small quantities of alcohol,

especially at night, is all that is necessary. Hot foot-baths invariably give immediate relief.

℞ Sweet Wine of Iron .....eight tablespoonfuls
Dose: One teaspoonful three times a day, after meals.

Migraine is a very severe variety, which affects particularly women and men of high intellectuality, Wheatstone and Herschel the astronomer affording examples of men who have suffered from it. In general it affects that part of the head as indicated by the shaded area in the accompanying illustration. A warning sign in some people is an extreme sensibility of the nervous system to external sensory impressions; for example, to sounds, so that a clock may be heard ticking in the next room or down-stairs, where it is usually quite inaudible. In some people a characteristic symptom appears after an hour or two, connected with the eyes. A bright spot is seen in one corner of the field of vision, and rapidly spreads across it, so that the sight becomes partially obscured; this spot may spread by bright flashes or by angles and projections resembling a plan of fortifications; or it may begin in the center of the field and spread outward. This temporary defect of vision is very characteristic of migraine, but it may be quite absent, and in its place great nausea and vomiting may come on, after which the headache appears and becomes gradually worse. The headache may be trifling in some persons, but it shows all degrees of severity up to a state of great agony and collapse, in which the face becomes pallid, the hands and feet cold, and the heart very feeble. Vomiting and a constant feeling of sickness are generally very marked, and the presence of these symptoms has gained for this type the name also of sick headache. The whole is over in a day or two days in general, but severe cases may last a week, and leave the sufferer quite broken down in health. An attack comes on first in early life, before the age of twenty-five, and may be repeated at intervals of months or years, ceasing as a rule entirely between fifty and sixty.



Treatment.—As this form of headache depends to a large extent upon debility, it is essential that the sufferer should, between his attacks, have light, nourishing diet, should take a full allowance of sleep, and should, as far as possible, avoid the forms of worry and mental strain which he finds bring on the headache. The tonics usually prescribed for these persons consist, among others, of arsenic, phosphorus, cod-liver oil, and quinine. During the headaches the drugs which seem to be of most use are antipyrine, valerian, and bromides. Hot mustard foot-baths will quickly relieve the pain. Careful attention should also be paid to the bowels, which should be kept open by the use of mild laxatives.

The following formula has been proved to give relief:

℞ Sulphate of Strychnine.....one-fortieth grain
Citrate of Caffeine.....one-half grain
Phenacetin.....three grains

Mix and fill one five grain capsule. Repeat in four hours. Not more than three to be taken in twenty-four hours. If any bad effects discontinue their use.

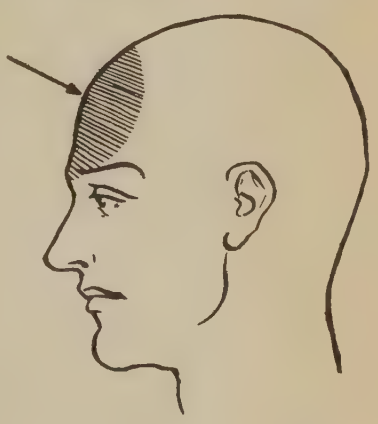
Sympathetic Headache is closely allied to migraine. It occurs in persons of delicate nervous organization, especially women, as the result of disorder in some distant part of the body, the pain of which is referred to the head, affecting usually the region as indicated by the shaded area in the accompanying illustration.

Carious teeth, wax in the ear, inflammation of the ovaries, and dyspepsia are the most frequent causes. Atonic dyspepsia, in persons who are out of health, who take little exercise, and who are afflicted with constipation, is the commonest form, and the drinking of iced water is said to be specially provocative of headache in these people. In children, far the most common cause, almost the only cause indeed of this headache, is eye-strain, due to some error in accommodation, which is banished after the child is fitted with suitable glasses. Other eye diseases, of which the chief are glaucoma and iritis, are now and then responsible for this headache.

Treatment.—A hot foot-bath will invariably relieve a severe headache. The following remedy has also been found very efficacious:

℞ Rhubarb and Soda Mixture....four tablespoonfuls
Dose: A teaspoonful fifteen minutes before each meal.

Hyperemic Headache is one of the most painful forms, and is generally accompanied by flushing of the face and throbbing in the region as indicated by the shaded area in the accompanying illustration. It is sometimes closely associated with the nervous type, occurring in hard and constant brain workers, who eat irregularly, and particularly in those who are addicted to the use of alcohol. Not infrequently it is allied in these cases with gout. This type of headache may be very severe for a day or two after a surgical operation.



People who have suffered from any head injury, such as sunstroke or concussion of the brain, are liable to have such a headache brought on at any time by excitement, or by alcohol even in small quantities. The headache which follows on the morning after a debauch of eating or drinking is of this type; so is that which sometimes precedes an attack of apoplexy or follows one of epilepsy. In young women, suppression of the menses in consequence of exposure to cold may result in headache till relief is obtained by bleeding at the nose or some other site.

Treatment.—If the person takes alcohol to any extent, this should be abandoned entirely. Coffee, tea, and similar stimulants should be sparingly taken. The diet should be a light one, of fish, white meat, puddings, and fruit; and it is important to keep the action of the bowels regular, as by taking some aperient water every morning. Bromides are useful when the headache is combined with sleeplessness. In very severe cases, cloths wrung out of iced water applied to the head, and renewed every two or three minutes, or ice-bags to the head and to the sides of the neck, often give great relief.

Hot foot-baths have been very helpful in relieving severe headache. The following prescriptions are also recommended:

℞ Potassium Bromide.....ten-grain powders
Dose: One powder when necessary to induce sleep.

Or:

℞ Acetanilid .....twenty-four grains
Bicarbonate of Soda.....thirty-six grains
Mix, and make into twelve powders.
Dose: One powder every three hours.

Toxemic Headache is that form due to the circulation of some poison in the blood which affects the functions of the brain and causes a general aching all through the head, and feelings of mental dullness. Most fevers, particularly smallpox, typhus, and typhoid fever, begin with severe headache, and even a simple cold in the head or an attack of influenza early shows this symptom. In malaria, headache is often one of the most troublesome symptoms; but the condition in which this type is most marked is the chronic form of poisoning, which occurs in Bright's disease, known as uremia. The inhalation of poisonous gases, for example from a sewer, or from a putrefying animal body, even the breathing of impure air in a badly ventilated theater or large public meeting, brings it on. This headache also affects persons who suffer from habitual constipation, owing to absorption of the products of putrefaction from the bowels.

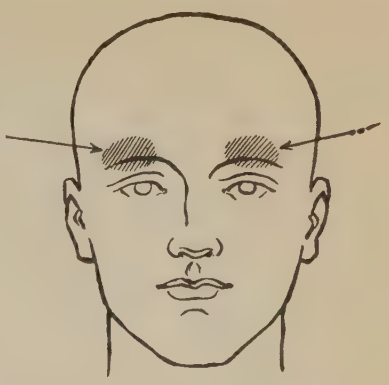
Treatment.—The cause of poisoning must, as the first essential, be removed. If Bright's disease be present it must be treated, and the bowels in every case attended to. Smelling-salts or eau de Cologne applied to the nose may bring relief in slight cases, and in severe cases phenacetine or antipyrine taken in the evening generally soothes the pain. The following may be taken:

℞ Ammonium Bromide.....ten-grain capsules
Dose: One capsule every four hours.

Or:

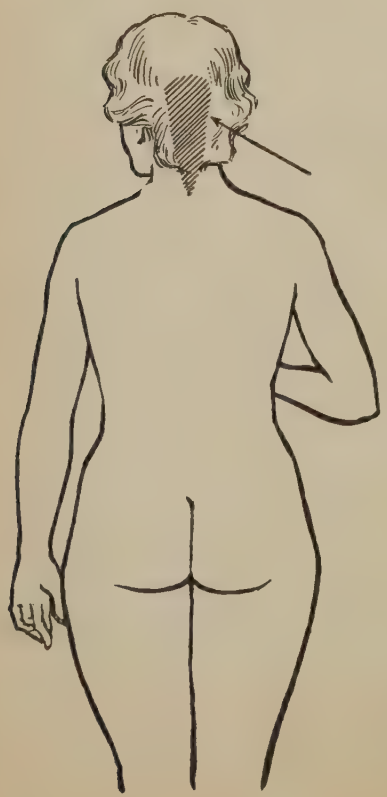
℞ Phenacetine .....twenty-four grains
Salol .....thirty-six grains
Mix, and make into twelve powders.
Dose: One powder every three hours.

Gouty Headache may be associated with an acute attack of gout, or sometimes takes the place of acute attacks. It is generally situated in the regions as indicated by the shaded areas in the accompanying illustration. Another form of gouty headache is a more or less constant pain due to the toxemic headache of chronic Bright's disease, which is often an accompaniment of gout. In addition to the pain, there are various other symptoms of gout, and great irascibility of temper.



Treatment.—The treatment is the same as for gout.

Rheumatic Headache usually affects the scalp, in consequence of exposure of the uncovered head to cold. It has this peculiarity, that the scalp is extremely tender, and brushing the hair may cause such pain that women may have to leave their hair undone.



Treatment.—It is treated by wearing some woolen garment round the head constantly, and by taking various anti-rheumatic remedies, such as salicylate of soda. Aspirin taken in ten-grain doses, every four hours, will be found valuable in this type of headache.

Organic Headache includes pains of various nature, and is usually located in the back of the head as shown by the shaded area in the accompanying illustration. It is due to some gross change in the substance of the brain or its coverings. Meningitis in children is one of the chief of these. In old people, thickening of the arteries of the brain, softening of the brain, or apoplexy, may produce constant dull headache. Tumors of the brain pro-

duce pain associated with giddiness and apparently causeless vomiting.

Treatment.—The headache due to a tumor is often relieved by the operation of trephining the skull, so as to reduce the pressure in its interior. Potassium iodide and bromides are also useful for relief. A hot foot-bath will generally stop the pain.

The following has been found beneficial:

℞ Iodide of Potash.....two teaspoonfuls
Bromide of Potash.....four teaspoonfuls
Peppermint-water .....six tablespoonfuls
Mix.
Dose: One teaspoonful in a wineglass of water, three times a day.

HERNIA—RUPTURE

Definition.—Hernia means the protrusion of any organ, or part of an organ, into or through the wall of the cavity which contains it. Thus hernia of the brain may occur in consequence of a severe injury to the skull; hernia of the lung in consequence of a wound of the chest-wall; but these are uncommon, and, as a rule, the name is applied only to hernia of the bowel, the popular term for which is rupture.

Causes.—Two factors come into play in causing hernia. First, some defect or injury of the abdominal wall; second, some increase of pressure within the cavity. With regard to the hernia at the umbilicus of young children, there is usually some defect on the closure of the opening through which the navel-string passes before birth, and through this opening a loop of bowel is forced by excessive crying or the like. In inguinal hernia, which, it may be noted, is far commoner in men than in women, the defect consists in some failure of the inguinal canal, through which the testicle descends before birth, to close completely. There may, in congenital hernia, be a completely open passage leading out of the abdomen, or there may be simply a small pocket in the peritoneum which, by a sudden strain or by long-continued pressure, such as coughing, gets torn or stretched in front of a protruded organ. Femoral hernia is commoner in women than in men, probably on account of the peculiar shape

and inclination of the pelvic bones, and arises in a manner similar to that of inguinal hernia. Both in these and in ventral hernia, the occurrence of marked changes in size of the abdomen, such as great increase in stoutness, great loss of fat, and repeated child-bearing, have the effect of greatly weakening the abdominal wall and predisposing to the formation of hernia. All laborious occupations involving great efforts, and bodily conditions involving frequently repeated strains, such as chronic cough or constipation, conduce to hernia of all sorts. Accordingly hernia is much more common in the male sex, who lead a harder life, than among females.

Symptoms.—The symptoms of hernia, apart from the mere presence of the swelling, are few. Sometimes, but only rarely, the hernia develops suddenly during some strain, the person being conscious of something giving way. As a rule, they grow gradually, and may attract attention first through a sense of weight or drag. When they become irreducible, they are likely to be accompanied by more or less dyspepsia and constipation. The great danger about rupture, especially inguinal and femoral ones, is that *strangulation* may occur at any time. This means that the circulation of the contents of the hernial sac is obstructed at the point where they pass through the abdominal wall. If not quickly relieved, this means that these parts turn gangrenous, and that in all likelihood general peritonitis and death will follow. The symptoms of strangulation are practically those of intestinal obstruction, the outstanding features being great pain and tenderness in the hernia, complete stoppage of the bowels, vomiting, and collapse. Strangulation is only likely to occur in cases of hernia of old standing, generally irreducible.

Preventive Treatment.—But little can be said on this point. In infants, while it is, no doubt, advisable to keep the abdomen tightly swathed for some little time after birth, and, from every point of view, to have them cry as little as possible, it is very doubtful whether any amount of care will prevent the formation of a hernia should Nature have failed to close the weak spots at the navel and the inguinal canal properly; whereas it is equally doubtful if any amount of crying will produce a hernia if these parts are formed perfectly. To advise no laborious work or lifting of heavy weights is, no doubt, a counsel of per-

fection, but it is scarcely practical. Constipation, however, may be avoided, and even the ill effects of straining at stool can be, to a large extent, counteracted if people would but "go back to Nature" and adopt the squatting posture for moving the bowels. In this attitude the thighs are brought up against the abdominal wall, and support it, while the openings of the inguinal and crural canals are almost impossible to force in this position. After confinements and abdominal operations, support for the abdominal wall by means of binders or belts is necessary for some considerable time.

Palliative Treatment.—This only applies to reducible ruptures, and consists in preventing the hernia from coming down by means of a properly fitting truss. To be of any real value the truss must keep the hernia up under all conditions, for, if it comes down behind the truss, the patient is in more danger of strangulation than if none were worn. It is therefore all-important to get trusses which fit perfectly. In infants and children a truss may also be curative, provided that it is worn constantly, and that the hernia is never once allowed to come down. If it does, then all the good of the previous wearing is undone. The chances of its being curative, however, are small, and only too often, even when cure apparently follows, the hernia recurs when the child grows up. A simple truss for use in young children may be made from a skein of worsted. Make a long loop at one end, place this over the hernia, carry the other end up in front of the opposite thigh, round the waist behind, down in front, through the loop, and between the legs, pinning or tying it to the circular part behind the back. For older patients three trusses are really necessary—one to wear during the day, one with a lighter spring and pad to wear at night, and one made of rubber or celluloid to wear in the bath, where there is a special tendency for the hernia to come down. For femoral, umbilical, and ventral ruptures trusses of different pattern are required, but the principles of application are the same.

Curative Treatment.—This means operative treatment, for there is no other means of cure. Considering the practically negligible risks of operation as contrasted with the ever-present risk of strangulation, with the necessity, perhaps, of operation under very unfavorable circumstances, and the disabilities which the presence of a hernia puts on one with regard to the public

services, in connection with insurance, etc., we would say that an operation for the radical cure is advisable in the vast majority of cases. It is not recommended in persons over sixty or in very stout people with irreducible ruptures, and perhaps children with very small ruptures might first be given the chance of a cure by a truss. On the other hand, it should be remembered that the operation in children (after weaning) is very simple, and practically invariably successful, whereas in adults it means a rather bigger operation and more time, which perhaps can be less well spared, and there is always a small percentage of cases in which the hernia will recur.

The particular operation employed will depend on the nature of the particular case, and must, of course, be left to the discretion of the surgeon. Should a person with a hernia develop symptoms indicative of strangulation, medical aid must be obtained at once, because immediate operation is necessary if the patient's life is to be saved. In the meantime the patient may be put into a hot bath, and gentle rubbing over the hernia employed. Occasionally, but not very often, the constriction may be relaxed in this way, and the contents of the hernial sac reduced back into the abdomen. Repeated or forcible attempts at reduction of the hernia must not be tried, as great damage to the inflamed bowel may be done. Even if these attempts at reduction fail, the patient will have been rendered more comfortable while in the hot bath, which is always some good accomplished.

PILES—HEMORRHOIDS

Definition.—Piles, or hemorrhoids, consist of a varicose and often inflamed condition of the veins about the lower end of the bowel, known as the hemorrhoidal veins.

Varieties.—It is usual to divide hemorrhoids into external piles, internal piles, and mixed piles. External piles are found outside the bowel, and are covered by skin, being brown or dusky-purple in color. Internal piles are within the opening, covered by mucous membrane, and are bright red or cherry-color. Mixed piles are those situated just on the margin, and covered half by skin, half by mucous membrane. Even internal piles do not extend more than an inch up the bowel, corresponding to the position of the internal sphincter muscle.

Causes.—There is always a tendency for the veins in this situation to become distended, partly because they are unprovided with valves, partly because they form the lowest part of the portal system, and are very apt to become overfilled when there is the least interference with the circulation through the porta vein, and partly because the muscular arrangements for keeping the rectum closed interfere with the circulation through the hemorrhoidal veins. Probably most people of middle life are troubled by this condition to some extent, especially men of sedentary habits who indulge in overeating and are troubled by constipation, as well as women who have borne many children. Habitual constipation is perhaps the principal cause of the presence of piles, and sitting on a cold stone or damp seat, or even a general chill, may suffice from time to time to inflame them and bring on what is popularly known as an attack of piles.

It must be remembered, however, that in a certain number of cases piles are merely a symptom of disease higher up in the portal system, causing interference with the circulation. They come on very frequently during pregnancy, passing off when this condition has terminated. They are very common in heart disease, liver complaints, such as cirrhosis or congestion, and any disease affecting the bowels.

Symptoms.—*External piles* may be present for years and give no trouble whatever, beyond occasioning pain of a cutting or burning character now and then, when a very costive motion is passed. When, in consequence of a chill or other cause, they become inflamed, they are very painful and tender from chafing against the thighs and clothing in walking, and from pressure upon the chair on which the person sits. The piles in these circumstances become enlarged and red, and give off a thin, blood-stained discharge. They may become so badly inflamed as to suppurate, and this sometimes results in a natural cure, or they may cure by filling with blood-clot and shriveling up into hard little knots. Such an attack of piles lasts generally a week or two, and then subsides till another chill is caught.

Internal piles may be slight, and may give no sign of their presence beyond occasional bleeding, which may vary from a mere streak, when the bowels are opened, to a discharge of several ounces of dark blood. They are apt to produce a constant discharge of mucus tinged with blood which soils the linen,

but unless very severe are not, as a rule, painful. These discharges of blood may, when copious and frequent, cause anemia and become a serious menace to the health, though they are never fatal. On the other hand, in plethoric overfed people they may be a very salutary thing, warding off gout and apoplexy, or relieving the heart when it is diseased. When internal piles are large they may come down with the movement of the bowels, and may then become inflamed and painful from time to time, just like external piles.

Treatment.—Constipation must, in the first place, be guarded against. The use of violent and irritating purgatives, like aloes, should be avoided if possible. The diet should, as a rule, include plenty of fruit, vegetables, and butter, and should in all cases be of a simple nature. Above all articles of food, alcoholic beverages tend to produce and perpetuate piles, and should therefore in bad cases be entirely abandoned. Regular exercise is very necessary in order to carry off the blood to the limbs and so relieve the portal circulation. An occasional dose of some substance that stimulates the liver, such as blue-pill, is beneficial.

Locally, great care must be taken not to irritate the piles, and when they are inflamed they should be washed with water every time the bowels move. Bleeding and the tendency to inflammation may be controlled by applying a sponge full of very hot water, or by smearing on adrenalin ointment. In the case of internal piles, which come down at stool, it is very important that they should be returned within the bowel each time by gentle steady pressure with the fingers. If they are down and inflamed, a hot bath followed by a belladonna suppository gives relief.

Generally these means suffice to keep the piles from causing trouble or to cure them completely, but occasionally surgical means are had recourse to. The external piles are simply removed with scissors or with the cautery. Internal piles require, according to their size and position, to be ligatured, destroyed by clamp and cautery, or, when they extend all round the bowel, to be removed *en masse* along with the last inch of mucous membrane lining the bowel. It is necessary for the patient, after one of these operations, to lie in bed for several days, and movement of the bowels is prevented for that period by narcotics, so that healing may quickly take place.

For external piles:

℞ Nutgall Ointment.....one ounce

Directions: Apply night and morning.

If there is severe pain present, the following is to be used:

℞ Tannic Acid.....twenty grains
Belladonna Ointment.....one ounce

Directions: Apply a small amount after each bowel movement.

CATARRH

Definition.—Catarrh is a term employed to describe a state of irritation of the mucous membranes, particularly those of the air-passages, associated with the copious secretion of mucus.

Causes.—Frequent attacks of colds, inhaling of dust, enlarged tonsils, irritating gases, adenoids, or foreign bodies in the nose.

Symptoms.—This complaint usually begins as a nasal catarrh or coryza, with a feeling of weight about the forehead and some degree of difficulty in breathing through the nose, increased on lying down. Fits of sneezing, accompanied with a profuse watery discharge from the nostrils and eyes, soon follow, while the sense of smell and to some extent that of taste become considerably impaired. There is usually present some amount of sore throat and of bronchial irritation, causing hoarseness and cough. Sometimes the vocal apparatus becomes so much inflamed (laryngeal catarrh) that temporary loss of voice results. There is always more or less feverishness and discomfort, and frequently an extreme sensitiveness to cold. After two or three days the symptoms begin to abate, the discharge from the nostrils and chest becoming thicker and of purulent character, and producing when dislodged considerable relief to the breathing. On the other hand, the catarrh may assume a more severe aspect and pass into some form of pulmonary inflammation.

Treatment.—The following solutions have been found very beneficial:

℞ Baking-soda ..... one tablespoonful
Listerine ..... two tablespoonfuls
Water ..... one teacupful

Mix.

Directions: Spray into the nostrils with a nasal douche.

Or:

℞ Baking-soda ..... one tablespoonful
Salt ..... one tablespoonful
Borax ..... one tablespoonful

Mix.

DIRECTIONS: One-half teaspoonful to be added to one teacupful of warm water and sprayed into the nostrils with a nasal douche.

Or:

℞ Glycerine ..... two tablespoonfuls
Borax ..... one tablespoonful
Alum ..... three teaspoonfuls
Water ..... one and one-half teacupfuls

Mix.

DIRECTIONS: Spray into the nostrils with a nasal douche.

TUBERCULAR GLANDS—SCROFULA

Definition.—Tubercular glands, or scrofula, is a very common disease of childhood, especially in the neck. It appears as if in many cases the glands become infected by the tubercle bacillus through the tonsils. The chain of glands in the region of the neck as indicated by the shaded area in the accompanying illustration becomes affected in most cases, while in others the glands inside the abdomen are diseased, producing the condition of wasting known as "tabes mesenterica." The condition progresses very slowly, as a rule, the glands enlarging for some months, then becoming matted together, to form an irregular mass, which softens, reddens here and there, and finally bursts through the skin to produce sinuses, which may go on discharging for years, healing finally with red, puckered, unsightly scars.

Treatment.—In the first stage, while the glands are simply enlarging, general treatment to improve the constitution is required. The child must stop attending school and should spend all his time in the open air, a change to the seaside being ap-

parently of special benefit. The diet should be constructed upon the same principle as that for other tubercular conditions. Various tonics, bitters, and aids to digestion should be given, of which the chief are arsenic, syrup of the iodide of iron, cod-liver oil, and malt extract. A bandage or other appliance is often used in order to keep the part where the enlarged glands are situated more effectually at rest. This form of treatment may be persevered with so long as the glands are not becoming matted together. When the latter change takes place it is usually best to have the whole mass removed by operation, after which healing is, in general, immediate, and a narrow, barely visible scar is left. When a chronic abscess has formed but has not burst, it is treated like a chronic abscess in other places. If suppuration be allowed to take place, and the abscess to burst of itself, it is almost impossible to avoid an unsightly scar. When this accident has occurred, and a discharging sinus is present, the best that can be done, in general, is for the surgeon to aid healing by scraping the sinus out and dressing it frequently in such a way that it may heal from the bottom.

The following tonics are highly recommended:

℞ Syrup of Iodide of Iron.....one fluid ounce
Dose: Twelve drops in water, or through a glass tube, as it discolors the teeth.

Or:

℞ Extract of Malt.
Dose: One tablespoonful after meals.

Or:

℞ Cod-liver Oil.
Dose: One tablespoonful after meals.

DROPSY

Definition.—Dropsy means an accumulation of watery fluid beneath the skin, or in one or more of the cavities of the body. The term is a general one, the accumulation in special localities having special names. Dropsy beneath the skin is known, when limited, as *edema;* when wide-spread, as *anasarca;* dropsy in the abdomen as *ascites;* in the chest as *hydrothorax;* and in the head as *hydrocephalus.*

Causes.—It is a great mistake to regard dropsy as in itself a disease, although this is a popular idea, supported by the fact that many deaths are recorded as due to dropsy without a further statement of cause. It is in almost every case merely a symptom, although in extreme cases a distressing symptom, of weakness in the walls of the minute blood-vessels (capillaries), which in turn is due to some constitutional weakness, or to failure of an important organ like the heart or kidneys. Three conditions are associated in the production of dropsy, and, generally speaking, at least two of these must be present: (1) weakening of the walls of the capillary vessels, by injury of the part in which dropsy occurs, by ill health of the body generally, by poverty of the blood circulating through and nourishing the vessels, or by poisonous materials in the blood; (2) increased blood-pressure in the veins; (3) a too watery condition of the blood, allowing fluid to escape from it through the capillary walls.

Heart disease, which produces increased pressure in the veins, and also an impure condition of the blood, in consequence of the defective pumping action of the heart, and Bright's disease, in which the kidneys fail in their functions of excreting poisonous substances and a certain amount of water from the blood, are the main causes of general dropsy. In heart disease the dropsy is more marked after exertion, in kidney disease it is found chiefly after resting. Thus one of the chief characters of dropsy due to Bright's disease is that it appears in the morning, affects loose tissues like the skin beneath the eyes, and passes off as the day advances. Dropsy due to heart disease, on the other hand, tends to appear toward evening, affects dependent parts like the feet, and vanishes during the night. When the two diseases are combined, the state of dropsy may become very grave.

In general debility due to overwork, bloodlessness, and the like, dropsy of the feet and legs frequently appears toward evening. The swelling which sometimes follows serpent-bites, bee-stings, or the eating of poisonous shellfish, and constitutes an extreme and rapidly ensuing form of nettle-rash, is a peculiar variety of dropsy. White-leg, which may appear after some acute disease like typhoid fever or pneumonia, or after the birth of a child, due to a thrombosis or plugging up of the main vein in the afflicted limb, is one of the localized forms of dropsy. A similar condition may be set up by a tumor pressing upon a large vein

of the arm or leg. Cirrhosis, tumors, and other diseases of the liver may, by interference with the circulation through it, cause dropsy first of the abdomen and later of the lower limbs.

Treatment.—The same treatment obviously will not apply to all cases. For the slighter degrees of dropsy the general treatment for the causal disease will usually suffice, no special measures being necessary. In cardiac dropsy complete rest in bed is essential, and heart tonics, particularly those which at the same time increase the flow of urine, such as digitalis, are usually administered. The amount of fluid can also be diminished by promoting a free movement of the bowels by the use of such a drug as compound jalap powder (thirty grains, or half a teaspoonful, every night), by a dry diet, and a salt-free diet, such as is referred to below. If the dropsy does not yield to drugs, and particularly when it is accumulating in the chest and causing great embarrassment to the heart's action with great shortness of breath, then some of the fluid must be drawn off by tapping. The treatment of the dropsy of acute Bright's disease is simply the routine treatment for that disease, which will be found referred to under that heading. In chronic Bright's disease it is permissible and advisable, which it is not in the acute form, to use drugs which stimulate the action of the kidneys, and of these one of the best is caffeine, provided that it is used in small doses only and intermittently—say one or two grains three times a day for a day or two, and then stopped for a day or so. Excellent results often follow the use of a salt-free diet—no salt is to be taken with the food, and none used in cooking, even the bread being made without salt. Meat is generally not allowed in the dietary of a patient with Bright's disease and dropsy, nevertheless it is often advisable in chronic cases to avoid giving large quantities of milk and other liquid foods, and such patients may do better on a diet of solid food like meat and bread. Drawing off fluid may be necessary just as in cardiac dropsy, and in both instances it may require to be done repeatedly. For dropsy of the abdomen, repeated tapping of the abdomen is usually necessary; sometimes, when the condition is due to cirrhosis of the liver, an operation is done with the object of allowing the blood, or, at all events, some of it, to get round another way than by way of the liver, and thus lessen the dropsy. Considerable success may attend this procedure.

Great benefits have resulted from the use of the following remedies:

℞ Compound Powdered Jalap .....five grains
Calomel .....two grains
Mix.
Dose: Take in one dose twice a week.

Or:

℞ Bittersweet .....four tablespoonfuls
Kava-kava .....four tablespoonfuls
Water .....two and one-half teacupfuls
Boil for half an hour, and strain.
Dose: One tablespoonful three times a day.

Or:

℞ Half an ounce of the herb "broom-tops" is placed in a pot with two cups of boiling water. Let this stand overnight and then strain off the liquid; this should measure eight ounces when finished.
Dose: One tablespoonful three times a day, before meals.

IMPOTENCE

Definition.—By impotence is understood inability to perform the sexual act.

Causes.—The commonest is probably a general neurasthenic or run-down condition, and this form is to be regarded as temporary, and can be quite well recovered from without any special treatment beyond that generally applicable to neurasthenia. We would just like to add a word of warning not to be terrified by the fearfully overdrawn pictures drawn in a certain class of advertisements regarding the evils attending loss of virility, manhood, etc., and attributing all this to disease of the genital organs and only to be cured by the use of the advertiser's nostrum. The condition is, in the great majority of instances, not a local disease at all, and is in no sense itself the cause of the other symptoms, but is simply one among them. In other cases the condition may be due to obvious disease of the organs of procreation.

Treatment.—The treatment of such troubles consists, in the first place, of complete cessation from sexual attempts. Take a course of hydropathic treatment, with baths, tonics, and out-

door exercise. Phosphagon in doses of one teaspoonful three times a day after meals will be found beneficial. The following prescription is also highly recommended:

℞ Ergotine .....one dram
Extract of Nux Vomica .....thirty grains
Phosphide of Zinc .....four grains
Arsenate of Iron .....four grains
Mix, and make into sixty pills.
Dose: One pill three times a day.

MYXEDEMA

Definition.—Myxedema is a disease characterized by a swollen and degenerative condition of the subcutaneous and connective tissues throughout the body, due to some defect in nutrition, which in turn is referable to a defect in the thyroid gland situated in front of the neck.

Causes.—It has been variously ascribed to mental worry, sudden nervous shock, frequent child-bearing, and other causes; but, beyond the fact that it is about seven times more common in women than in men, and that the great majority of cases arise in middle life, between the ages of thirty and fifty, little is known as to its production. Like cretinism, myxedema appears often to run in families, and indeed sporadic cretinism appears to be a very similar disease, producing different symptoms in children on account of their undeveloped state.

The important part of the thyroid gland secretion is believed to be an iodine-holding body which is concerned in the processes of nutrition. Deprivation of the secretion causes a deposition of fat, a varying degree of dropsy, and above all an excessive formation of loose connective tissue, from which there is often obtainable after death a considerable amount of mucoid material, a fact to which the disease owes its name. This connective tissue presses upon and destroys the proper tissues of the organs.

Symptoms.—A person suffering from myxedema to a marked degree presents a most characteristic appearance. The face is swollen, the features coarse, and the expression dull and unrelieved by any passing emotions or interests. The skin generally is dry and yellow, but the cheeks are usually bright red in con-

trast. The hair is thin, harsh, and brittle, and the person may even be completely bald. The intellectual functions also are slow, the speech is deliberate, the formation of ideas, as for example in answer to questions, and indeed all the ordinary affairs of life, take far longer than in the case of healthy persons, but there is, nevertheless, in the early stages, no impairment in the quality of mental processes. Later, memory becomes bad, and the person grows deaf and very drowsy. Though at first the temper is placid and lethargic, in the later stages irritability and delusions appear, and the person, if untreated, may ultimately become quite insane.

Along with these more obvious changes there is general swelling all over the body. The hands assume the so-called spade-like appearance, and the person, partly in consequence of the slowness of his movements, partly as the result of weakness, becomes very ungainly. The cold is often complained of by the invalid, who has difficulty in keeping himself warm, and, if the temperature be taken, it is usually found to be subnormal (96° to 98° F.).

Cases last for many years even when untreated, and the disease is seldom directly fatal. As a rule myxedematous patients grow better and worse from time to time, though the trend is for the disease to get more marked. When the case is treated, improvement almost always takes place with great rapidity, and treatment is effective even after the person has been ill for many years.

Treatment.—The necessary and sufficient treatment consists in the administration of the thyroid gland of some animal. Sheep's thyroid is prepared in the form of a liquor, or is to be obtained in a dried condition, or in tablets, and in one of these forms must be made an article of diet for the remainder of life, in order to supply the place of the person's own defective thyroid gland. When the last traces of the disease have vanished, a small dose once or twice a week will suffice in most cases to maintain the health, but if the remedy be discontinued for any great length of time, symptoms of myxedema again surely assert themselves.

Great care is necessary in the early stages of cure that overlarge doses of the thyroid gland are not taken. Otherwise disturbance of the stomach and bowels, headache, feverishness,

palpitation of the heart, and attacks of faintness and prostration may come on. These unpleasant symptoms are prevented by taking very small doses at first, after which the system gets tolerant of greater amounts.

Persons suffering from myxedema feel the change of climate greatly, especially low temperatures, and should protect themselves from exposure. A warm, sunny climate is advisable. Warm baths are beneficial.

The formula given below is most efficacious:

℞ Extract of Sheep's Thyroid Gland.

Directions: Take either a one-grain tablet or a powder containing one grain, three times a day. Increase one grain every third day until a five-grain dose is taken three times a day.

BOILS—CARBUNCLES

Definition.—Boils, which are sometimes known as furuncles, are small areas of inflammation starting in the roots of hairs, and due to the growth of a microörganism. When a large number of boils form close together at one time the mass is called a carbuncle.

Causes.—The essential cause is bacterial, as stated, but many circumstances predispose to the growth of bacteria around the sheath of the hair, within which they are constantly found, though harmless. Diabetics and the subjects of Bright's disease are specially troubled with boils, so that anyone specially liable to them should submit himself to medical examination in case he suffers from one of these diseases. Persons who eat too much meat food, who are constipated, or who are recovering from an exhausting illness, are very liable to them. Friction, which irritates the hair roots, is a very important cause, and therefore boils are commonest on the back of the neck, on the forearm, and on the leg, while those who row or ride have them about the seat.

Symptoms.—A red swelling forms round a hair, and causes a good deal of irritation and scratching. It gets larger for some days, being, as a rule, not very painful, unless subject to chafing. When, however, the boil begins on the head, in the ear, or in the nose, where the tissues will not stretch readily, the pain may be

very great. Even after two or three days the swelling may slowly subside, and the inflammation gradually pass off, the boil being said to abort. In most cases, about the sixth or seventh day the top of the boil breaks, and some thin fluid, and perhaps matter, oozes out. The yellowish core, consisting of a small mass of dead tissue, is now seen occupying the interior of the boil, and this comes away about a couple of days later, after which the boil speedily heals. If the boil be not treated, however, the first is very apt to be followed by a crop of others in the neighborhood, owing to the discharge from the first boil infecting other hairs. There is a special danger in boils of the upper lip and nose; for these may lead to inflammation within the head. Generally a boil, though its presence causes great annoyance, does not lead to fever or other general symptoms. But in boils of the ear, or about the face, there may be high temperature and great prostration, which are serious signs. Carbuncles are exhausting, and in old people very dangerous.

Treatment.—The boil should be kept as still as possible, and the best method for doing this is to spread a small portion of cerate of resin on a small square of lint and strap it over the boil with adhesive plaster; and this may encourage the boil to burst.

Equal parts of brown sugar and laundry soap make an excellent poultice. A small square of rubber adhesive plaster containing mercury and carbolic acid may be applied and renewed as it loosens. If, however, the boil is painful, or if it is proceeding to suppuration, a wet antiseptic dressing (carbolic acid 1 to 20) covered with oil-silk, absorbent cotton, and a bandage, should be applied. When the boil has burst and the core come away, it is a good plan to wipe out the cavity with a minute drop of pure carbolic acid, which kills all remaining bacteria. Carbuncles, painful boils, and boils about the lip and nose are generally opened at once, and wiped out with pure carbolic acid, but healing is then slower than if the boil be allowed to run its course. General treatment in the direction of tonics, good food, avoidance of alcohol, and free daily evacuation of the bowels by Epsom salts or Seidlitz powder, is also necessary; and the taking of calcium sulphide in small doses often repeated (one quarter of a grain six times a day), or of yeast in larger doses, is said to prevent the formation of new boils. New boils are more effectively prevented from forming by rubbing powdered boric acid gently

into the skin around the old boil twice a day after washing and drying.

The following tonic is considered beneficial:

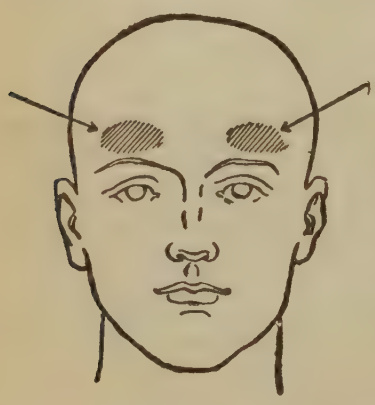
℞ Fowler's Solution .....two tablespoonfuls
Dose: Five drops in water three times a day for two weeks.

CHILLS AND COLDS

Chills and colds form a subject of some importance because, although, in general, trivial ailments, they are often the prelude to serious diseases.

Causes.—A cold follows generally some chill to the surface, such as exposure to a draft of cold air, breathing in a foggy atmosphere, wetting of the feet on a cold day, sudden immersion in water, etc., some persons being specially liable after one of these to develop a catarrh of the respiratory passages and a feverish state. In other cases errors in diet seem either to bring on the same condition or to assist the effect of cold. Often a cold in the head runs through all the members of a family, and it is doubtful whether such an infectious cold is due to bacteria or to some atmospheric influence affecting the members of the family in common.

Symptoms.—A cold in the head with catarrh of the nose is known to every one; the catarrh sometimes extending up into the frontal sinuses and causing a severe pain in the forehead as indicated by the shaded area in the accompanying illustration; or involving the maxillary sinuses and causing faceache; or even spreading up the Eustachian tubes and causing inflammation of the middle ear with excruciating earache. Generally these secondary affections disappear as the cold gets well, but suppuration may result in these various cavities, most commonly in the middle ear, though seldom in the frontal sinus. When the throat is the part affected, inflammation of the tonsils, or quinsy, is liable to result, especially in rheumatic persons. In



persons who use the voice much, or in those who indulge overmuch in alcohol, the larynx is a weak point, and laryngitis, with huskiness or even temporary loss of voice, is the common result of a chill. The cold may affect the respiratory passages farther down and bronchitis then results, or if the surfaces of the air spaces in the lungs be inflamed, pneumonia is the condition produced. When the air-passages from the larynx downward contain mucus, coughing results, this being a series of involuntary explosive expirations designed to force the irritating substance up into the mouth. Bronchitis depends to a large extent upon the presence of bacteria, while pneumonia is almost always due to the pneumococcus. Some persons have a liability, as the result of a chill, to catarrh not of the respiratory, but of the alimentary system, as shown by ensuing dyspepsia or diarrhea. It should be remembered that a so-called cold is the commencement of several infectious and serious diseases, such as measles, whooping-cough, influenza, consumption; and with regard to the latter especially, one should seek medical advice and examination whenever this apparently trivial malady lasts more than a very short time.

Treatment.—The sense of stuffiness that accompanies a cold in the head may be relieved by rubbing the sides of the nose downward for ten minutes night and morning with lanoline. In children, a favorite household remedy for feverish colds is tincture of aconite, but it must be remembered that this is a very dangerous drug. A cold may often be got rid of at its commencement by a hot bath at bedtime, followed by warm drinks to produce perspiration, and a rest of twelve hours or so in bed. The best warm drinks for this purpose are hot lemonade and hot milk, or their place may be taken by a tablespoonful of Mindererus spirit, or a teaspoonful of sweet spirits of niter, in water, at bedtime. Instead of a hot bath, one may steep the feet for five or ten minutes in water as hot as can be borne, to which have been added two tablespoonfuls of mustard, mixed first of all with cold water.

For a feverish cold with slight cough, ammoniated tincture of quinine in doses of one teaspoonful, two or three times a day, taken in a wineglassful of water, forms a popular and very useful remedy.

When there is quinsy or rheumatic pain, salicylate of soda and

phenacetine (ten grains of each) are perhaps best, but if the dose of these is repeated, it should be of five grains each. In all inflammations of the throat, oily applications, such as camphorated oil, and a flannel bandage to the neck, do much good. When there is a threatening of bronchitis, with sense of oppression in the chest, poultices or mustard plaster to the front of the chest, together with an inhalation of a teaspoonful of compound tincture of benzoin in hot water, give much relief. In all these internal catarrhal conditions, heavy eating must be avoided, but soothing fluids, such as warm gruel, or milk and water, are very serviceable. In the very young and very aged, colds form a serious illness.

The following modes of treatment have proved beneficial:

℞ Fluidextract of Catnip.....four tablespoonfuls
Fluidextract of Saffron.....three tablespoonfuls
Mix.
Dose: One teaspoonful every two or three hours.

Soak the feet in hot mustard water for ten or fifteen minutes; dry thoroughly; go to bed between blankets with a hot-water bottle at the feet, and drink slowly two cups of hot milk or lemonade.

Camphor.—Fifteen drops in a teacup of hot water, on going to bed; sleep between blankets, with a hot-water bottle at the feet.

Arsenicum.—Two one-grain tablets every half-hour for four doses. If no relief has been obtained, continue the same dose every hour until relieved. This is a homeopathic remedy, but it has proved very successful in cases where there is considerable discharge from the nose and watering from the eyes, and can only be purchased at homeopathic drug stores.

PHARYNGITIS

Definition.—This is a chronic inflammatory condition affecting the wall of the pharynx or throat proper.

Causes.—It is usually associated with derangements of the digestive organs, but may accompany chronic laryngitis, and is often caused by the irritation of highly spiced food or of con-

stant drinking of alcoholic liquors, or even by excessive tobacco-smoking.

Symptoms.—On looking into the back of the throat, while the tongue is held down, one sees the mucous membrane unduly red and glazed-looking, with enlarged lymph-follicles like sago-grains scattered over it. Small varicose veins are often seen here and there, and when these burst the person may spit up a good deal of blood, which he is apt to attribute wrongly to some disease in his lungs. Pharyngitis of a severe type also forms a part of clergyman's sore throat. It produces considerable irritation, cough, tickling in the throat, and discomfort which may last long if not treated.

Treatment consists in removing any cause of irritation, in remedying any dyspepsia that may be present, and in the application to the part of mild caustic solutions such as nitrate of silver, or of the galvano-cautery. The following gargle is very beneficial:

℞ Tincture of Chloride of Iron...four tablespoonfuls
Dose: One teaspoonful in half a glass of water. Use as a gargle.

ENLARGEMENT OF THE GLANDS

Simple enlargement and suppuration of a gland generally follow upon the presence of some wound or other source of infection in the area drained by the lymphatic vessels going to the gland. For example, a gum-boil may result from the presence of a carious tooth, and, as the gum-boil subsides, a gland beneath the jaw may enlarge, become inflamed, and pass on to suppuration and form an acute abscess. Again, any source of irritation about the head, such as lice or eczema, is apt to produce swelling of the glands behind the ear and down the neck; or a wound of the foot or hand to cause inflammation of the glands in the groin or armpit respectively.

Treatment.—The object at first is to prevent suppuration of the enlarged and inflamed gland. For this purpose the source of irritation must be removed by opening the gum-boil, cleaning the head, dressing the wound of the foot, etc. The gland itself is best let entirely alone, or at most kept supported and at rest

by a pad and flannel bandage. Later, as the inflammation subsides, various counter-irritants may be applied to assist in its reduction to a natural size. If the swelling becomes soft and the skin over it reddened, suppuration is taking place, and the condition must be treated as an acute abscess.

The following is recommended for the bowels:

℞ Fluid Cascara.....four teaspoonfuls
Rhubarb and Soda Mixture....two ounces
Dose: One teaspoonful every three hours, with a swallow of water.

Or:

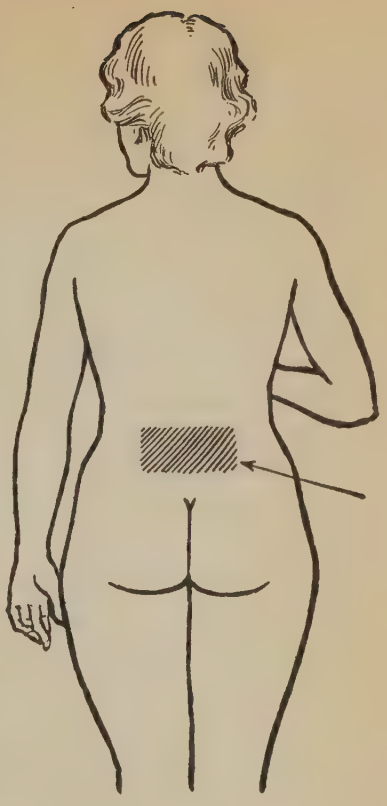
℞ Syrup of Iodide of Iron.....one ounce
Dose: From five to fifteen drops with water, according to age of the patient, three times a day, after meals.

BACKACHE

Definition.—Backache is a symptom of many diseases. In addition to being the result of local causes, pain referred to the back is often due to disease or disorder in deep-seated organs. The reason is that the brain is not accustomed to deal with impressions from these organs, and, accordingly, seems to feel the pain in parts of the surface which are supplied by the same nerves as the organs in question, and from which painful and other impressions are constantly coming.

Causes.—(*a*) *Local.*—Lumbago, or a rheumatic condition in the muscles or nerves of the loins, which may be of a chronic aching nature, or may come on suddenly, feeling like a blow, is the commonest cause. A similar condition is often set up by unwonted exercise of these muscles in golfing, rowing, and the like. Weakness in growing boys or girls may cause a feeling of extreme weariness every day, and may be associated with lateral curvature of the spine, if not attended to. Spinal disease sometimes causes backache, and is associated with rigidity of the back, and often with great tenderness to the touch, with or without any deformity.

(*b*) *Indirect.*—Bright's disease of the kidneys is sometimes a cause, in elderly persons, of pain in the region of the back as in-



dicated by the shaded area in the accompanying illustration. All sorts of pelvic trouble in women, such as menstrual disorders, prolapse of the womb, and ovarian inflammations and tumors, are constantly accompanied by a dull, dragging-down pain in the back. Gallstones cause an acute pain high up near the right shoulder. Stomach ulcers and catarrh often cause a pain above the level of the last rib and close to the left side of the spine. Backache is also one of the first symptoms of smallpox, and of several other febrile diseases.

Treatment.—This is of course the treatment of the disease causing the pain. When the pain is due to a local cause, such as lumbago, the loins must be kept warm by extra clothing or a flannel belt. Belladonna plaster relieves it, also massage, ironing with a flat-iron through a piece of cloth, and, in acute cases, application of mustard plaster, hot fomentations, or a hot-water bottle. Weakness in young persons can be overcome by Swedish drill, calisthenics, and other forms of exercise, with regular daily periods of rest, and the careful avoidance of stooping or a twisted position at lessons. Perhaps the best exercise of all for strengthening the muscles of the back is obtained by the use of a skipping-rope.

The following tonic is recommended for backache:

℞ Basham's Mixture.....six ounces
Dose: One tablespoonful in a wineglass of water, every three hours.

℞ Iodide of Potash.....two teaspoonfuls
Acetate of Potash.....two teaspoonfuls
Aniseed-water .....six tablespoonfuls
Mix.
Dose: One teaspoonful three times a day after meals.

HAY FEVER

Definition.—Hay fever, otherwise known as hay asthma, summer catarrh, and autumn catarrh, means a peculiar inflammatory condition of the mucous membranes of the eyes, nose, and air-passages, which year after year affects certain individuals from the middle of May till the latter part of September.

Causes.—This malady seems to a certain extent to run in families, heredity playing a part in about thirty-three per cent. of cases, according to one authority. It is certainly about twice as common in men as among women, and seems especially to affect persons of active temperament and high mental development. Occasionally it appears to be associated with gout. Some have tried to trace the presence of hay fever to structural defects in the nose, but even if these be present they have probably little to do with the malady. The popular idea, which has long attributed attacks of hay fever to the pollen from hay-fields, has been shown to be correct, though behind this there must be some predisposing constitutional cause that renders some persons liable to attacks while the majority of people are quite immune. The old theory that the inflammation results from the pollen sending down its pollen-tubes into the mucous membrane of the nose and throat is now known to be incorrect, the cause being in all probability almost always some poisonous substance or toxine contained in the pollen. A toxine capable of producing hay fever has been found in the pollen of twenty-five different grasses and of seven other plants. This toxine can be extracted by means of water and alcohol, and when applied to the eye or nose of susceptible people brings on quickly an ordinary attack of hay fever. More than this, Dunbar has, by injecting the toxine into sheep, goats, and other animals, obtained an antitoxic serum which is sometimes capable of preventing or of curing these attacks.

Symptoms.—It begins with an itching of the eyes and nose, followed by symptoms of a severe cold or influenza, such as headache, violent sneezing, and profuse watery discharge from the eyes and nose, together with dry, hard cough, and occasionally severe asthmatic paroxysms. The attack usually runs a course of several weeks, and, in addition to making the person

miserable, or even incapacitating him for work while they last, repeated attacks may lay the foundation for serious chest disease. If rainy weather come on, the symptoms may abate, and susceptible persons who remove at such time, when the malady is about to recur, to the seaside or a place where vegetation is scanty, rarely suffer. A journey through a country district, in the heat of summer, seems specially apt to be followed by a bad attack.

Treatment.—The most effectual method of treatment in hay fever is to avoid the exciting cause, namely, the neighborhood of grass-fields, during the summer season. Removal to the seaside often succeeds in putting an end to an attack, and many persons who are liable to the complaint make such a change annually before its expected onset, and thus escape. A solution made of one grain of sulphate of quinine to three ounces of distilled water makes an excellent spray for the nostrils.

If the eyes and nostrils are much irritated, use the following:

℞ Zinc Sulphate.....ten grains
Borax .....one-half teaspoonful
Rose-water.....eight tablespoonfuls

Directions: Dissolve the zinc sulphate in the rose-water and add the borax; shake well. Spray into the nostrils every three hours.

Or:

℞ Wine of Ipecac.....two teaspoonfuls

Directions: Spray the throat.

Or:

℞ Spirits of Camphor.

Directions: Inhale deeply the fumes.

Or:

℞ Thymol (pencil or inhaler).

Directions: Inhale deeply the fumes.

CLERGYMAN'S SORE THROAT

Definition.—This name is given to a complication of throat ailments, which gradually comes on in those who do much public speaking, and who possess weak vocal organs. Persons who suffer from it, as a rule, produce the voice badly, using the throat as a resonating chamber instead of gaining the full volume of the

voice by keeping the lungs expanded. Speaking, accordingly, is performed with great effort, the more so as the muscles of larynx and throat become soon tired. These muscles increase in size, the mucous membrane of the throat and even of the nose becomes congested as a result, and catarrh follows on every slight chill, chronic laryngitis and pharyngitis being set up. Still greater vocal efforts of an incorrect kind being made to overcome the consequent huskiness and feebleness, the condition gets inevitably worse and worse, till public speaking may become an utter impossibility.

Treatment.—The first essential is to obtain a correct voice-production, by expansion of the chest, for the chest is often badly formed or undersized, and by a course of lessons on elocution from a good teacher. The affected person must also get out of the bad habit of straining the throat in speaking. Secondly, the mucous membrane of the throat must be got back to its original state by inhalations of ammonium chloride; by gargles of potassium chlorate, solution of common salt (two teaspoonfuls to a tumblerful of cold water); by painting with tincture of iodine or glycerite of tannin, and similar procedures. When the chronic inflammatory condition has proceeded further, and has set up considerable laryngitis and pharyngitis, the case should be under the care of a throat specialist, for local astringent applications to the larynx, throat, and nose are necessary, or even the reduction of swollen mucous membrane by the cautery. In advanced stages, complete rest of the voice for six months may be essential, and a change to some climate where the air is warm, moderately moist, and quite free from dust, may be advisable.

℞ Ammonium Chloride.....three-grain tablets
Dose: One tablet dissolved in the mouth every two hours.

ALBINISM

Definition.—This is a state of poverty or absence of pigment in the superficial tissues of the body, producing a pale pink color of the skin, whiteness of the hair, and redness of the iris and interior of the eye. A person showing these peculiarities is called an albino. It may also occur only in patches.

Causes.—It is generally congenital, existing from birth, though the parents of an albino are not necessarily subjects of albinism. It is most marked among the dark races, such as the negroes of West Africa, and is said to be due, in some cases, to poor food and unhealthy surroundings of the mother.

Symptoms.—An albino may show nothing remarkable beyond white hair, delicate skin, and pink eyes, but many are physically and mentally feeble. Usually the absence of pigment to screen the eye from bright light gives rise to trouble. The person has a tendency to inflammation of the eyes, and to shade the eyes keeps the head down and avoids going out by bright daylight.

Treatment.—There is no remedy. The eyes should be protected in bright light by wearing smoked glasses. If two persons with partial albinism should marry, the children are apt to be more complete albinos.

ORIENTAL SORE—DELHI BOIL

Definition.—Oriental sore is a disease of tropical climates in which an ulcer begins in a small pimple, spreads, and then heals very slowly, leaving an unsightly scar.

Causes.—From the fact that the sore affects not only persons of all ages and social positions, but also the lower animals, it appears to be contagious, and not dependent on any constitutional condition.

Treatment.—Dressings of boric acid lotion, iodoform ointment, or other simple and soothing antiseptic applications appear to do most good. The following dressing is recommended:

℞ Tincture of Iodine..... one teaspoonful
Carbolic Acid..... one-half teaspoonful
Water ..... six tablespoonfuls
Mix.
Directions: Pour this on the dressing.

ACTINOMYCOSIS

Definition.—Actinomycosis is a chronic suppurative disease affecting cattle, in which it is known as "woody tongue," and sometimes it is found in man.

Causes.—The direct cause is the ray-fungus or actinomyces,

which lives in the tissues, reproduces itself there, and by its irritation causes hard swellings, abscesses, and ulcers, in the pus of which the fungus is found in little yellow balls of a size which can just be made out by the naked eye. These little balls are found to consist of masses of thread-like material matted together, and of club-shaped bodies radiating from a common center, hence the name of ray-fungus. The disease is not very infectious, and though sometimes communicated from sick cattle to people attending them, it usually comes from chewing raw grain, especially barley, in which the fungus grows naturally, or from inhaling the dust of diseased grain from a threshing mill, but it seldom communicates itself to thoroughly healthy people. It may occur in any organ, but chiefly about the mouth.

Symptoms.—These are general bad health, the presence of hard fibrous masses about the mouth or tongue, or in other organs, and the development sooner or later in these masses of abscesses which after bursting form sinuses or ulcers that will not heal.

Treatment.—One must attend, first of all, to the general health by giving good food, cod-liver oil, tonics, etc. Potassium iodide is given, and has a special effect in causing absorption of the hard masses, and probably stimulating the bodily tissues to destroy the fungus. Surgical means, however, are generally necessary, consisting in the free opening and scraping out of all diseased tissue, irrigation with strong antiseptics, and leaving the wound open so that discharge containing the fungus may readily escape. The bowels should be kept well regulated by the use of mild laxatives.

℞ Iodide of Soda..... four teaspoonfuls
Peppermint-water ..... six tablespoonfuls
Dose: One teaspoonful in half a glass of water, every four hours.

ABSCESS

Definition.—An abscess is a localized collection of pus or matter. A minute abscess is known as a pustule; a diffused production of pus is known as cellulitis or erysipelas.

Treatment.—As soon as there is evidence that pus has formed, we know that nature's attempt to destroy the bacteria has been successful, and, as the further formation of pus is designed simply to burst a passage to the exterior, we can relieve pain, stop unnecessary destruction of tissue, and shorten the process by opening the abscess. This is done as soon as there is evidence from fluctuation, redness, or pitting of the skin that pus has formed. Previous to this nature's efforts may be aided by the application of poultices, or better, because of its cleansing effect on the skin, by applying warm antiseptic fomentations, such as carbolic lotion. These have the effect of diminishing the pain; of aiding resolution, if abscess formation is not going to take place; and of hastening the formation of an abscess cavity, and softening the overlying tissues if the latter process have already begun. When the abscess is opened three things are attended to:

(1) That important structures such as arteries in the neighborhood are not damaged.

(2) That the opening is as far away as possible from a new source of infection like the mouth or anus.

(3) That the opening is large and so situated that the cavity can drain itself completely; otherwise, if the abscess cavity be large or irregular, a collection of fermenting pus takes place, and the wound will not heal but forms a sinus; for this reason it may be necessary to make two or more counter-openings.

After the abscess is opened a simple wet dressing, of moist lint covered by oil-silk, and this again covered by absorbent cotton (to absorb the remaining discharge) and a bandage, should be applied and changed daily. If the cavity be large it may be necessary to stuff the opening with a strip of gauze or lint, or to insert a drainage tube, so as to insure healing from the bottom of the cavity. The following tonic is recommended:

℞ Syrup of Iron Iodide.....three teaspoonfuls
Emulsion of Cod-liver Oil.....six ounces
Mix.
Dose: One tablespoonful half an hour after each meal.

Or:

℞ Calcium Sulphide.....one-quarter-grain tablets
Dose: One tablet three times a day, one hour after meals.

CANCER AND SARCOMA

Definition.—Cancer and sarcoma are two forms of tumor to which the term malignant is applied, because they destroy the general health, break down the organs in which they grow, after apparent removal tend to grow again, and by rapid spread lead usually to death in some months or years. Cancers are composed mainly of epithelial cells, or cells similar to those of skin or of the mucous membrane of the stomach and bowels, but imperfect in form and arrangement, while sarcoma is a tumor developing in the connective tissues of bone, muscles, sinews, etc., and in structure resembles imperfect connective tissue. Sarcoma is less common and rather less malignant than cancer.

Causes.—The cause is still undiscovered. Many theories have been put forward, and, considering the fact that cancer is gradually becoming more frequent, it has become of great importance to establish the nature of the cause as a first step toward treatment, and much has been done in the last few years by various cancer research laboratories to increase our knowledge as to the mode of spread and conditions of growth in this disease. Many have searched for bacteria as the cause, but in vain, notwithstanding the fact that cancers resemble forms of chronic inflammation like lupus and leprosy more than they do simple tumors. Others have fancied they found minute animal organisms called coccidia, and still others a form of yeast fungus in cancers, but neither of these seems to be the cause. Some scientists have supposed that there is no external cause necessary, but that in early or embryonic life parts of the developing body come to rest, only to start sudden and irregular growth later in life. Several facts, though not causes, are important in the origin of the disease:

Injury.—Smoking a clay pipe has been observed to bring on cancer of the lip, constant alcoholic indulgence to favor cancer of the throat and stomach, while a scar is not infrequently the starting-point.

Infection.—It is unquestionable that the inhabitants of certain districts suffer more from cancer than those of others. Houses get the name of "cancer houses" when person after person living

in them gets the disease. It is very often noted that a husband and wife are both affected one after the other.

Heredity.—It seems to be quite certain that the children, especially women, of parents who have died of cancer show slightly more than the average liability, though this fact is vastly exaggerated in the popular mind.

Age.—Cancer is extremely rare before middle life, the commonest age being fifty to sixty. Sarcoma is commoner in younger persons.

Sex.—Cancer is commoner in women than in men. But cancer of the stomach is slightly commoner in men.

Health and habits.—Healthy, robust people are, on the whole, oftenest affected, and members of long-lived families are specially liable in later life. Poverty and bad food are not at all causes, because cancer is said to be commoner among the upper classes, especially in those who eat much animal food.

Symptoms.—These vary according to the organs interfered with. Thus in the stomach there is dyspepsia; in the bowels, interference with the motions; in the jaw, great neuralgia; in the womb, flooding; where a vein is pressed on, dropsy; and so forth. When on the surface, there is a hard swelling, and the lymphatic glands near at hand become soon affected by secondary growths if the original one be not speedily removed. This is especially the case in cancer, less so in sarcoma, and is one reason why cancer is so liable to return after apparently complete removal. A state of very bad health and weakness, called cachexia, results when a cancer begins to ulcerate, as it does when it invades the skin or an internal mucous membrane, and sometimes before ulceration. The disease known as rodent ulcer, which is on the borderland of cancer, may exist on the face for years, as a small ulcer with thickened edges, and then take on rapid growth.

Treatment.—It cannot be too strongly insisted upon that the only cure for cancer is its complete removal by operation. To this statement only a partial exception can be made in the case of very superficial growths such as rodent ulcer, a form of cancer affecting the skin, and which can be cured by X-rays or radium, etc. The earlier the removal is done, before the growth has extended far from the starting-point, and especially before secondary growths have occurred, the better is the prospect of com-

plete removal and cure. If the operation is done sufficiently early, the prospects, with modern surgery, are often good. The unfortunate thing is that, either from fear, ignorance, or lack of symptoms pointing to anything serious, so many cases are seen by the surgeon only when it is too late to get the growth completely removed. We would therefore urge the necessity of anyone, and especially anyone of forty or over, who notices a hard swelling, or who begins, for no very obvious reason, to suffer from symptoms which might be due to cancer of some internal organ, to consult a physician at once. Do not waste valuable time in trying any of the reputed cancer cures in the hope that an operation may be avoided; in the present state of our knowledge the person who advises their use is little better than a murderer; their employment can only be justified in cases which are beyond operative measures, in the hope that they may do some good. If the swelling should turn out not to be cancer, then, at all events, much mental worry and anxiety will be avoided. The same remarks apply to sarcoma in young people. For inoperable cases of both cancer and sarcoma there are various measures which may be employed for the relief of symptoms, but these do not require to be detailed.

GANGRENE

Definition.—Gangrene means the death of a part of the body sufficiently large to be seen. When the process is slow and superficial, only microscopic parts dying in succession, the process is called ulceration, while the term necrosis is usually restricted to the death of internal parts, particularly of bones. There are two varieties of gangrene, dry and moist, dry gangrene being a process of mummification, in which, as a rule, the circulation simply stops, and the part, so to speak, withers up, while in moist gangrene there is inflammation accompanied by putrefactive changes. The dead part, when formed of soft tissues, is known as a slough, and when part of a bone, is called a sequestrum.

Causes.—Certain diseases which lessen the strength and vitality of the tissues throughout the body render them more liable to die when subjected to injury. Chief among these are Bright's disease and diabetes. Hard work with insufficient food devitalizes the body in the same way. The nervous system, too,

exerts an important influence over the nutrition and repair of the body, so that where it is diseased a very trifling injury may produce gangrene of the injured part.

Direct injury is perhaps the commonest cause. If a limb be badly crushed, or frozen, or burned by heat or powerful chemicals, it may not recover.

Infection by bacteria is another and the most serious cause, though fortunately it is rare and seldom occurs save in people of very low vitality. The hospital gangrene, so much dreaded by surgeons fifty years ago, belonged to this type, but is now practically unknown, thanks to antiseptic surgery.

Symptoms.—*Dry gangrene* usually comes on in old people with diseased arteries, and is preceded by pain in the affected limb, which gradually becomes a dusky red color and later brown and black. The line between the dead and living tissues is quite sharp (line of demarcation), and marked by a red ring, where a slight degree of inflammation is going on. There is some odor, especially if care be not taken to keep the foot absolutely dry. There is little or no pain after gangrene has occurred, nor any fever, and the red ring gradually deepens till the gangrenous part drops off in the course of some months.

Moist gangrene is the more common form, and is accompanied by putrefaction. The part becomes swollen, livid, and covered with blisters containing fluid; later it turns green and black in places. The smell is very offensive, and much fluid is effused from the decaying tissues, speedily soaking the dressings applied. There is not much pain, but the general symptoms are apt to be very serious, and there is then high fever. In the latter case the person may die of blood-poisoning, and in any case the line of demarcation is not definite, and the gangrene is apt to extend up the limb.

Treatment.—The surface should be bathed with boric acid or other antiseptic frequently to render the gangrene dry. In rapidly spreading cases, due, for example, to infection following upon diabetes, the amputation must be performed high up on the limb, so as to get well beyond the infected area. When small parts, like the fingers, become gangrenous after frost-bite, they may be treated by applying on lint some simple antiseptic ointment, such as boric acid ointment, containing a small amount of eucalyptus or other volatile oil, to subdue the odor.

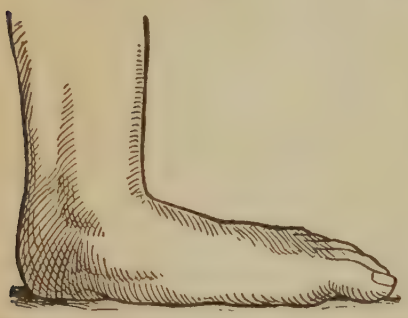
The following antiseptic solution is recommended:

℞ Creolin .....one-half teaspoonful
Water, boiled .....one pint

Directions: Bandage the part and keep the dressing moist with this solution.

FLATFOOT

Definition.—Flatfoot is a deformity of the foot in which its arch sinks down so that the inner edge of the foot comes to rest upon the ground. The arch of the foot is to a considerable extent an indication of character and habits, for flatfoot seldom or never occurs in active, energetic people.



Flatfoot, showing complete loss of the arch

Causes.—Sometimes, in weakly children wearing high shoes, the arch gives way a little, but this is remedied by tonics, removal of the shoe heels, and instructing the child to walk with the toes turned in. Most cases occur in growing and underfed young men and young women, who have much standing on the feet, such as errand-boys, waiters, housemaids, shop-girls. The ligaments which support the arch are in these persons still soft, the four muscles (two tibial muscles on the inner side, and two peroneal muscles on the outer side) which sling it up become weak or tired, and hence the arch gradually subsides.

Symptoms.—There is pain both along the instep and beneath the outer ankle, the foot is stiff and broad, walking is tiresome, and the toes turn far out. The footprints of a flatfoot are broad, all the way from toe to heel, instead of being a mere line at the instep. The fact as to whether a person has flat feet or not may be tested by wetting his bare feet with inky water and causing him then to stand on a piece of clean white paper.

Treatment.—Change of occupation to one which allows of sitting is necessary. Tiptoe exercises should be performed for ten minutes night and morning, and the legs thereafter bathed with cold salt water and massaged. This may be enough; if not,

a steel sole, with instep to support the arch, may have to be worn inside the shoe. The toes should be habitually turned inward in walking. In very bad cases of long standing, it may be necessary either to wrench the foot into position under chloroform, and put it in plaster of Paris for a month, or even to remove part of the bone from its inner side, so as to shorten the instep and make a new arch.

CLUBFOOT—TALIPES

Definition.—Clubfoot, or talipes, is a deformity in which the foot is permanently twisted at the ankle-joint, so that the sole no longer rests on the ground in standing.

Talipes equinus

Varieties.—The foot can be twisted in four directions. The heel may be pulled up so that the person walks on his toes (*talipes equinus*); the toes may be bent up so that he walks on his heel only (*talipes calcaneus*); the sole may look inward so that he walks on the outer edge of the foot (*talipes varus*); or outward so that he walks on the inside of the foot (*talipes valgus*). These are usually combined, the heel being drawn up and the sole turned inward (*equino-varus*), or the heel resting on the ground and the sole looking outward (*calcaneo-valgus*). A more important division is into those cases in which the deformity exists at birth, which are generally at first fairly easily rectified; and into those cases which are acquired later in life as the result of some disease, which do not yield to such simple treatment.

Talipes equino-varus

Causes.—The cases found at birth are due to some arrest of development, or some faulty position of the

fetus in the womb. The popular idea, that a fright received by the mother may cause the deformity, is improbable. Those which are acquired later may be caused by some spasm in the muscles of one side of the leg, or by paralysis of the muscles on the side of the leg away from the deformity, or by rigidity due to the scar following a burn or inflammation.

Treatment.—For the cases acquired after birth, an elaborate treatment, including one or several operations, or the wearing of some special appliance to support the ankle in the correct position, is usually necessary. When the deformity is due to paralysis, the application of massage and electricity to the affected muscles is often requisite. When it is caused by scars or muscular spasms the muscles or their tendons must be divided before replacement in the correct position is possible. In all cases it must be remembered that, after the foot has been placed in good position by operation or otherwise, the cure is not complete till after several years of care, because there is, for long, a great tendency to relapse.

The cases found deformed at birth have some distortion in shape of the bones about the ankle, but as these bones are very soft in the young child, the condition is often quite remediable by attention on the part of the mother or nurse. The position of the foot must be corrected several times daily, the nurse grasping the fore part of the foot and pressing it gently, slowly, and firmly into position, after which she holds it in place for five or ten minutes. In addition to this, the muscles of the leg, especially those opposite the side to which the foot turns, should be repeatedly massaged every day. Generally it is also necessary to apply a splint which holds the foot in the correct position, so that, as growth goes on, the bones are molded to the proper shape in a few months.

If the condition be not attended to at once after birth, and also in bad cases, an operation may become necessary, consisting, during the first few months of life, in the division of tendons, and if deferred till later, in the removal of parts of the deformed bones, so that the foot may be brought to its natural position. Not only may there be a deformity in the foot, but at birth the doctor or nurse should thoroughly examine the infant, as such deformities as clubfoot, flatfoot, obstruction of the bowels, hair-lip, tongue-tie, or cleft palate may exist.

CARE OF THE FEET

The modern shoe is not made to fit the foot; rather is the foot made to fit the shoe. The lack of care in the selecting of one's foot-wear is the cause of most of the ills which affect the feet. High-heeled shoes, dress slippers, and most of the fine boots offered for one's inspection may be neat, but they seldom or never fit properly. The shoemaker should take tracings of the feet, and have shoes made from these tracings.

For comfort in walking thick woolen socks are essential; thin fancy socks and openwork stockings must be avoided by people with tender feet. Socks and stockings should be marked "right" and "left"; the universal practice of clothing the right foot with the sock that happens to lie nearest the hand is wrong.

Tender feet may be rendered less tender by a little care. Bathing them in salt water or in a solution of alum in water every night hardens the skin. In hot weather socks ought to be worn once only. Dusting powder is much used by soldiers when on route marches. Perhaps the best remedy for tenderness is soap; turn the socks inside out and smear the toe with ordinary soap. People who dance much will find that a sock smeared with soap will prevent blisters arising. Mendings often cause irritation, especially when at the heel of the sock; and a "shuffling" shoe is fatal to comfort. People who suffer from foot tenderness should always wear shoes or boots with very thick soles, such as golfing shoes. Socks made after the manner of gloves, with separate parts for the toes, are sometimes recommended.

Those who desire not only comfort but neatness of the foot will treat the feet as they treat their hands. Apply the methods of manicuring to the toe-nails; cut them straight across, and press down the skin or "quick" that overgrows the nails.

Corns.—These are the result of the intermittent pressure produced by tight boots. The corn may grow on any of the toes or on the sole of the foot, or it may occur between the toes. In the former case it is usually hard, while in the latter it is soft.

Prevention.—See that the shoes do not pinch the feet in any way. It is better to have them made to order than to trust to getting a comfortable ready-made pair.

Treatment.—Soak the foot in warm, soapy water until the corn is softened. Then with a clean razor shave the corn, and apply a plaster. The object of the plaster is to diffuse the pressure produced by the boot.

After soaking the foot and before applying the plaster the following may be painted over the corn each night:

℞ Salicylic Acid.....fifteen grains
Flexible Collodion.....two teaspoonfuls

Care must be taken to see that the dead skin is removed before the next application of the paint.

In treating hard corns, iodine can be used as follows. Paint the corn with iodine every night for four nights, omit the application for two nights, and then apply again for four nights. At the end of this time the corn can be easily removed with the fingers.

Bunion.—As the result of pressure on the inner side of the base of the big toe a small sac containing oil develops over the bone. This sac is produced in order to lessen the effect of the pressure on the bone. The bone, however, usually becomes inflamed, new bone is deposited, and there is formed a lump which tends to force the big toe to override the second toe.

Prevention.—Here, again, one should have the shoes made to order.

Treatment.—If the bunion is inflamed, rest the foot and apply cold cloths. Absorbent cotton ought to be worn between the big toe and second toe to keep the former in its place. Should the bunion be troublesome a doctor must be consulted, as possibly the removal of the oil-sac is the only remedy.

Chilblain.—This is most common among children, and is due to poor circulation and to the lack of proper protection of the feet in cold weather. The affected toe becomes swollen and red, and may form the seat of a sore. At first the part is itchy, but soon it becomes painful.

Prevention.—Thick woolen stockings and shoes with thick soles ought to be worn out of doors. Warming the feet before putting on the shoes should be avoided.

Treatment.—The foot and limb ought to be massaged in order to promote a good supply of blood to the part. The general health ought to be improved by means of cod-liver oil or other

tonics. Balsam of Peru should be applied to the affected toe.

Sweating Feet.—In hot weather this is a common and troublesome complaint. As a result of it blisters and sores may develop, especially on the feet of those who walk a good deal.

Prevention and Treatment.—The feet should be washed in salt water every night and carefully dried, special attention being paid to the spaces between the toes. A fresh pair of woolen socks, well dusted inside with boracic powder, should be worn each day. If blisters develop, prick them with a needle which has been sterilized by holding it in a gas-flame for a minute. Then apply a piece of lint covered with zinc ointment.

Ingrowing Nail is a troublesome condition affecting only the nails of the toes. It is due to a variety of causes, chief among which are the pressure of badly fitting shoes, cutting away of the corners in paring the nails, and want of attention to the nails, whereby accumulations of scarf-skin and dirt collect beneath the nail, and by putrefactive changes cause ulceration of the skin at the sides. The condition also occurs in old, bedridden people, mainly for the last-named reason.

Treatment is simple, though sometimes tedious. It consists in the wearing of well-made shoes, cutting of the nails square across without paring away the corners, and the packing two or three times daily of a shred of boric lint between the corner of the nail and the skin which it is chafing. These measures are generally sufficient after a little time, but sometimes the nail is so much thickened that the edges cannot be raised up to admit the threads of lint. In this case the center of the nail may be softened by dabbing on caustic potash, and then the nail is easily thinned down by scraping with a sharp knife or a piece of broken glass till it becomes quite pliable. When the skin at the side of the nail bleeds very readily, this is remedied by touching with bluestone or with a caustic pencil.

AUTOINTOXICATION

Definition.—Autointoxication means, literally, self-poisoning, and is any condition of poisoning brought about by substances formed in or by the body. With regard to microörganisms, many of these produce by their growth substances which, after

accumulating to a certain amount, check the growth if they do not destroy the life of the organism; for example, the alcohol formed by the yeast plant. A similar condition occurs also in animals and man.

In certain persons substances are formed during the digestion of various foods which produce great irritation; and in those subject to habitual constipation a state of ill health is caused by substances formed in and absorbed from the bowels. Acute diseases, like pneumonia, tetanus, and diphtheria, are, broadly speaking, examples; for their most serious symptoms are due to poisons circulating in the blood, though produced, not by the body itself, but by microörganisms implanted in it. Other examples are furnished by death due to breathing in a closed place like a box, where the person is killed by his own emanations; by diseases of the liver, like jaundice and acute yellow atrophy, when the liver fails to excrete poisonous substances which it ought to get rid of in the bile; by diabetes, in which the patient may become unconscious and die owing to the formation in the blood of acetone or some similar substance; and by gout, in which changes in the joints follow on faulty chemical processes in the tissues.

℞ Fluidextract of Cascara.....four teaspoonfuls
Salicylate of Sodium.....four teaspoonfuls
Rhubarb and Soda Mixture... six tablespoonfuls
Mix.
Dose: One teaspoonful in a wineglassful of water, half an hour after meals.

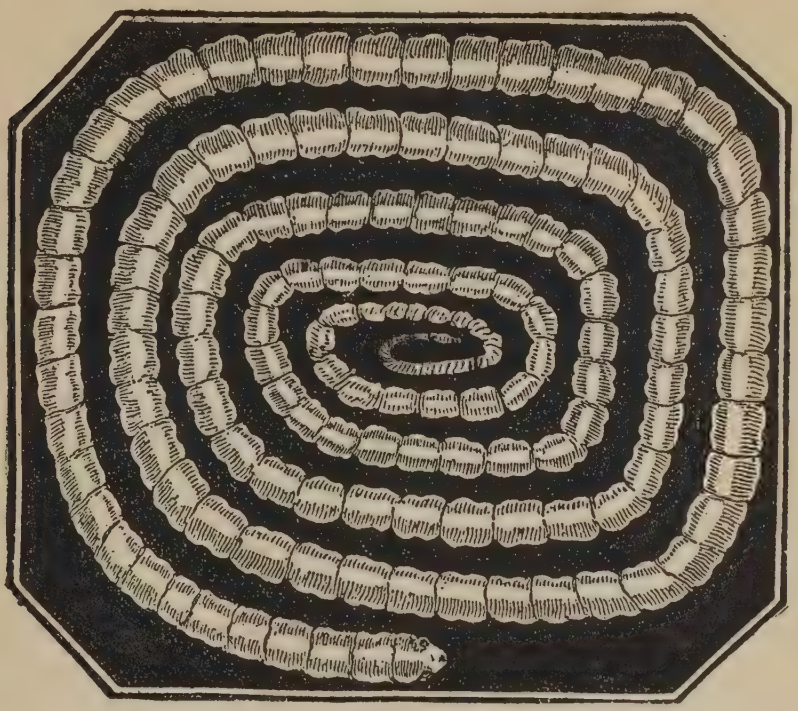
Or:

℞ Epsom Salts.....two tablespoonfuls
Rochelle Salts.....two tablespoonfuls
Cream of Tartar.....two tablespoonfuls
Black Draft.....three ounces
Dose: One teaspoonful three times a day.

TAPEWORM

Definition.—These animals exist solely to feed and to propagate their kind, discharging apparently no useful function in the economy of nature. Accordingly their shape is modified to present as large an absorbing surface as possible to the digested

food passing down the intestine, so that they are flat, white, and long, like a piece of tape, as their name implies. Each consists of a head. the size of a small pin's head, provided with suckers,



and sometimes with hooklets, for adhesion to the bowel-wall, and from this head segments are produced that gradually increase in size and develop ova the farther they recede from the head. The mature segments at the extremity of the worm are crammed full of ova, and are constantly splitting off to be discharged in the stools.

Symptoms.—The presence of tapeworms in the intestine does not long remain a matter of doubt. Generally, they give rise to voracious appetite, digestive disturbances such as diarrhea, bloodlessness, and headache, and they may produce signs of grave general irritation, such as convulsions.

Treatment of intestinal worms consists in the administration of substances which are poisonous to the worm, but not strong enough to injure the patient. Koosso, kamala, turpentine, etc., are given for this purpose, but the most effective drug is extract of the root of the common male-fern, combined with starvation. Whatever remedy be adopted, the fragments of worm passed

must be carefully examined to see that the head has been expelled, for, if it be retained, the worm will most probably grow again.

Pumpkin-seed Treatment.—Take two ounces of dried pumpkin-seed and grind into a powder. Add sufficient honey to make a paste. Prior to taking this mixture, the patient should live on a very spare diet during the day, and the bowels should be emptied by taking an ample dose of Epsom salts. This purgative should be taken about twelve hours before the medicine. The pumpkin-seed mixture is best taken at seven o'clock at night. Another dose of Epsom salts should be taken the following morning.

As this treatment will only be a success if the head comes away with the body of the worm, it is advisable to watch the stools carefully. If, however, this treatment is not successful the first time, it should be repeated in a day or two. Too much care cannot be exercised in this treatment, as it must be remembered that if the head is not removed, the worm will grow again. Half a teaspoonful of resin of male-fern in one ounce of glycerine can be taken instead of the pumpkin-seed and honey, if preferred.

THREADWORM

Definition.—The threadworm is the most common of all the intestinal parasites and the least harmful. It is about a quarter of an inch long, white, and resembles, as its name implies, a little piece of thread. These worms live in considerable numbers in the lower bowel, affecting children particularly. They cause great irritation round the anus, often diarrhea, sometimes in female children discharge from the vagina, and in weakly children nervous symptoms such as convulsions. The reflex irritation they occasion makes the child also pick his nose, and grind the teeth during sleep.

Treatment is often effected by repeated purgation with some saline, such as Epsom salts. In addition, small doses of santonine (two grains) may be administered, but the best treatment consists probably in giving an enema of strong solution made from common salt and tepid water, or of infusion of quassia, made by taking one teaspoonful of quassia wood and boiling it in a pint of water. While it is still warm, it is injected into the

rectum by a regular rectal syringe. This operation should be repeated once every day until the irritation ceases. This infusion of quassia acts on the worm directly. The local irritation caused by the worms near the anus is allayed by a weak white precipitate ointment.

ROUNDWORM

Definition.—Roundworm, also known as the "maw-worm," is rounded, of a pale-brownish color, and may be ten to twelve inches long, resembling an earthworm very closely. These worms, two or three in number, may live in the small intestine, but one may wander into the stomach and be vomited up. They give rise to few symptoms beyond voracious appetite, and sometimes diarrhea and colic.

Treatment is best administered in the following manner. After a day of fasting take one powder containing ½ grain of Santonine with one grain of Calomel at bedtime followed the next morning by a dose of Castor Oil or a cup of Senna Tea. If one treatment is ineffective wait a day or two and repeat the above. Adults may take larger doses. The preparation should be carefully administered and its effects carefully observed.

ENLARGED SPLEEN

In some of the acute infectious diseases, the spleen becomes congested and acutely enlarged; for example, in typhoid fever, anthrax, and plague. The condition, however, which most frequently attracts attention is rupture of the spleen. This accident may occur, like rupture of other internal organs, in consequence of extreme violence, but in malarious countries, where many people have the spleen greatly enlarged and softened as the result of malaria. A mustard plaster placed over the affected area generally gives relief, or paint the parts with iodine.

OCCUPATIONAL DISEASES

Many occupations are more arduous than others, or necessitate great exposure to the weather, or lead to irregularities in the matter of eating and drinking, so that those who pursue them are specially liable to suffer from minor illnesses or nerve strain.

But beyond this, certain trades and professions bear a close relationship to certain definite diseases, which are therefore known as trade or occupation diseases.

Poisonous Trades.—*Arsenic* is a substance largely used for many purposes. Thus the smelters of ores containing arsenic, the makers of green artificial flowers, wall-papers, painters of green china, and others who come in contact with Scheele's green, are liable to be affected by eczema, neuritis, and other symptoms of chronic arsenical poisoning.

Lead is a substance very widely used and very readily absorbed into the system, so that workmen who, at first sight, appear to have little or nothing to do with this metal may suffer from lead-poisoning. Thus, in addition to the makers of white lead, plumbers, and compositors who handle lead constantly, file-cutters who use a leaden cushion at work, house-painters who burn off old paint, glass-polishers and pottery-glazers who are apt to inhale lead-containing dust, are all liable to contract lead-poisoning if they do not adopt proper precautions.

Phosphorus, in the form of yellow phosphorus, is apt to injure match-makers, though the red phosphorus employed for safety matches is harmless. Match-makers affected by the phosphorus fumes suffer from general ill-health, and are liable to necrosis of the jaw, known as "phossy jaw." Some authorities attribute this condition of the jaw to the direct action of the phosphorus; others regard it simply as a manifestation of tubercular disease occurring severely in weakly persons.

Mercury affects felt-hat-makers and those persons who use nitrate of mercury in their work.

Rubber workers who are exposed to the fumes of carbon-disulphite sometimes suffer from headache, tremors, and mental and visual disturbances.

Nitrobenzole workers, and those who employ this substance in the preparation of perfumes, aniline, etc., are subject to sleepiness, headache, disturbance of the gait, and sometimes atrophy of the optic nerves, leading to blindness.

Treatment.—The treatment of occupational diseases necessitates change of vocation, plenty of fresh air, rest, and free purgation of the bowels. Hot baths are recommended to be taken each night. The diet should be rich and wholesome and contain meat only once a day.

As a tonic, the following is recommended:

℞ Elixir of Iron, Quinine, and
Strychnine.....six tablespoonfuls
Dose: One teaspoonful in a wineglass of water, half an hour before meals.

Trades Affecting Lungs or Heart.—Glass-blowers, partly on account of the heat amid which they work, partly owing to the strain of blowing, suffer from bronchitis and emphysema, and are also liable to deafness. Iron-workers, partly in consequence of their laborious work, partly owing to the habits of intemperance which this is apt to induce, seem specially liable in later life to contract valvular heart disease, and to suffer from increase in size and force of this organ. Clergymen, though specially exempted by their even life from heart and lung conditions, are very liable, along with other public speakers, to suffer from a special type of sore throat. Persons working among irritating particles and constantly inhaling them are more than ordinarily liable to contract consumption; among these trades may be mentioned those of stone-cutters, steel-grinders, cotton-workers, flax-workers, flour-millers. Especially are these trades liable to cause consumption when the work is carried on by underfed persons in badly ventilated workrooms. Potters display a special liability to disease of the lungs resembling consumption, but coal-miners enjoy a curious exemption notwithstanding the impregnation of their lungs with carbon particles.

Spasms and Paralyses are liable to affect those whose occupation requires the constant use of one muscle or group of muscles to perform the same action over and over again. Sometimes the affected part becomes painlessly contracted whenever an attempt is made to perform the action; in other cases, the spasm is accompanied by a good deal of pain; and in still other cases, the muscles waste and great weakness ensues. In early cases the condition improves with rest and change of employment; but in advanced cases the weakness may be due to degeneration of the nerve-cells in the gray matter of the spinal cord, and recovery is then hopeless. Among these *occupation neuroses,* as they are sometimes called, may be mentioned writer's cramp, typewriter's cramp, telegrapher's cramp, miner's nystagmus (twitching of the eyes from straining them at work in an awk-

ward position), hammerman's palsy, and the spasmodic wryneck of shoemakers, saddlers, and book-folders. Caisson workers, who labor in compressed air, suffer among other things from pains in the limbs, and sometimes from paralysis.

URIC ACID

Uric acid is a crystalline substance, very slightly soluble in water. It is white in the pure state, but when found as a urinary deposit it is yellow, presenting a supposed resemblance to cayenne pepper. The biurate of sodium and urate of ammonium occur in considerable amount in the urine during a feverish state or after great exertion, and produce, as the urine cools, a dense pink or yellow sediment. The total daily quantity of uric acid passed by human beings seldom exceeds ten grains, although in the urine of birds and reptiles uric acid is the chief nitrogenous constituent, taking the place of the urea secreted by human beings. Uric acid, like urea, is formed in the liver and removed by the kidneys from the blood. The amount is increased in the following conditions:

(*a*) Overmuch meat diet, combined with sedentary habits.
(*b*) Gout.
(*c*) Diseases in which the white corpuscles of the blood are increased, as leucemia.

Owing to their insolubility, uric acid and the various urates frequently produce deposits in the urinary passages, which are known as urinary sand, gravel, or stones, according to their size.

℞ Sodium Benzoate.....five-grain tablets
Dose: One tablet every three hours, with water.

Or:

℞ Urotropine.....five-grain tablets
Dose: One tablet dissolved in half a glass of water, every three hours.

INFLAMMATION

Definition.—Inflammation may be defined as the reaction of the tissues to any injury, short of one sufficiently severe to cause their immediate death. The term is limited sometimes to the changes which take place when bacteria enter the body, but the

changes in the latter case, though specially severe, are essentially the same as those produced by any other source of irritation. There are four cardinal symptoms of inflammation, viz., redness, heat, pain, and swelling, all of which, and particularly the last, are present in greater or less degree, so that these are also made a basis for defining the condition. The changes that take place have been studied by observing under the microscope the tongue, mesentery, or foot-web of frogs, newts, and similar animals in whom these structures are very thin and transparent. The changes which take place as the surface dries or on the application of various irritant substances are easily seen. These changes have been confirmed, so far as other tissues and other animals are concerned, by examination after death.

The first sign of inflammation consists in a dilatation of the arteries and veins of the affected part, so that the blood circulates in it more quickly and in larger quantity than before, thus causing heat and redness. Very soon, however, and apparently as the result of some change in the walls of the veins, the circulation becomes gradually slower, and the white corpuscles of the blood are seen to adhere to the inner surface of these vessels. Later, these corpuscles push their way in great numbers through the walls of the smaller veins and capillaries, migrating into the surrounding tissues along with large quantities of the fluid material of the blood and a few red corpuscles. Hence the swelling, which is the most characteristic sign of inflammation. These white corpuscles discharge many functions. In the first place, they have been seen, originally by Metchnikoff, and later by other observers, to attack the bacteria which have invaded the tissues, to envelop them in their own substance, and, apparently by a process of digestion, to break them up. They also remove tissues which are dead or useless. Others of them, at a later stage, when the source of irritation has been removed, play a part in producing the new tissues to repair the damage done, though the greater part of this repair is effected by cells from the surrounding tissues.

One of two results may follow inflammation. Either *resolution* may take place, when the white corpuscles, having played their part, find their way back into the circulation after the process of repair has been started at the site of injury, and the circulation proceeds as before, or *abscess-formation* results, the

circulation comes to a complete standstill in the affected part, an excessive number of white corpuscles migrate from the vessels, an area of tissue becomes destroyed, and the process ends by a discharge of pus through the surface of the body.

Symptoms.—As mentioned above, redness, heat, pain, and swelling are the classical symptoms of inflammation, and there are usually general symptoms of high temperature, feverishness, etc., varying with the severity of the inflammation. Various special symptoms are set up in special localities, for example, inflammation of the mucous membranes of the stomach and bowels leads to a copious excretion of mucus, and is known as catarrh; inflammations of outlying parts, if they are very severe, may cause death of these parts, and are then called gangrenous inflammations; intense inflammation limited to a surface may destroy patches of the surface and convert them into a leather-like membrane, such types being known as croupous inflammations, etc. Inflammation may become chronic, and in this case not only does the process described above proceed in a minor degree, but there is an exaggerated process of repair leading to the formation of much fibrous or scar tissue, which may come to replace almost entirely the organ in which the chronic inflammation is proceeding, thus rendering the organ small, hard, and irregular in outline.

Treatment.—In the earlier stages of an inflammation, cold, either in the form of ice or of evaporating lotions applied to the part, appears to be the remedy *par excellence*.. Later on, cold has little effect, and moderate warmth with moisture, as gained by poultices or fomentations, has an emollient action, soothes pain, and, if an abscess be inevitable, allows this to form more quickly. Sedative substances, such as bromides, are also employed to soothe pain. When the inflammation is a superficial one and direct applications are possible, various antiseptic washes, emollients, and astringent powders are applied. Where the inflammation is deep-seated, various means are taken to control excessive congestion in the blood-vessels of the affected organ, the chief being counter-irritation and blood-letting. Bier's method of treatment for inflammation aims at increasing the reaction of the tissues through producing in them a passive congestion by means of light constricting bands and other means. It is often very successful in cases where the reaction is slight.

In chronic inflammations, counter-irritation to the skin surface is the most successful remedy.

OBESITY—CORPULENCE

Definition.—Obesity is a condition of the body characterized by the over-accumulation of fat under the skin and around certain of the internal organs. In all healthy persons a greater or less amount of fat is present in these parts, and serves important physiological ends, besides contributing to the proper configuration of the body. Even a considerable measure of corpulence, however inconvenient, is not inconsistent with a high degree of health and activity.

For some persons, and particularly among some races, a degree of corpulence is natural, and though the following table represents the average weight and chest measurement for men at thirty years of age, of varying height, it must be accepted as true for health only with a wide margin. A person's weight may be one seventh over the figures given and yet within the limit of health, while, on the other hand, if the weight is not more than one seventh below the average weight this is not indicative of bad health. The average woman should weigh rather less for her height than the figures shown in the table.

Height ft.	Height in.	Weight, lbs.	Circumference of Chest in Inches
5	0	112	33½
5	1	116	34
5	2	126	35
5	3	133	35
5	4	139	36
5	5	142	37
5	6	145	37½
5	7	148	38
5	8	155	38½
5	9	162	39
5	10	169	39½
5	11	176	40
6	0	180	40½
6	1	183	41

The average weight of the clothing is $\frac{1}{24}$ of the male body, and the above weights include clothing. An addition of about three pounds for every four years of age over thirty must be made to the above figures, as the weight tends naturally to increase until old age sets in.

Causes.—Various causes are assigned for the production of corpulence, but it must be admitted that in many cases it cannot be accounted for. In some families there appears to be a hereditary predisposition to an obese habit of body, upon which precautions in living seem to have very little effect. But, beyond this, it is unquestionable that certain habits favor the occurrence of corpulence.

A luxurious, inactive, or sedentary life, with overindulgence in sleep and absence of mental occupation, are well-recognized predisposing causes. The more immediate exciting causes are overfeeding and the large use of fluids of any kind, but especially alcoholic liquors. Fat persons are not always great eaters, though many of them are, while again, leanness and inordinate appetite are not infrequently associated. Still, it may be stated generally that indulgence in food, beyond what is requisite to repair daily waste, goes toward the increase of fat. This is more especially the case when the non-nitrogenous (the fatty, saccharine, and starchy) elements of the food are in excess. It is generally held that the fat of the body is mainly, if not entirely, formed from these foods, while nitrogenous (albuminous) foods increase oxidation and lead to tissue waste. Alcoholic liquors, when taken to a considerable extent, also tend to the formation of fat, partly because many of them, such as beer, contain much sugar, and partly no doubt because a portion of the body heat is derived from the alcohol and a corresponding amount of the starchy and sugary food spared, and converted into fat. It is advisable that alcoholic liquors be avoided in case of obesity.

Women are prone to become more corpulent than men, and appear to take on this condition more readily after having borne a child, and after the cessation of the function of menstruation. Probably their more sedentary life, and the fact that a woman's blood is relatively poorer in oxidizing power than that of a man, have much to do with this. For the same reason, girls suffering from bloodlessness tend to become fat as well as pale and weak. Fat is an incomplete oxidation product, and when it is either burned or utilized for the supply of heat or energy in the body, it is converted into carbonic acid gas and water, this change failing to take place under the above conditions either because the supply is too great, or because the demand of the body for heat and energy is small.

Defective muscular exertion has been mentioned as a cause of corpulence, but it is sometimes observed that stout men, when they begin to take active exercise, become fatter still, the reason being that the appetite is sharpened and still more food is taken.

Several drugs have the power of producing a fatty change in the tissues, among which arsenic and mercury may be specially mentioned, so that persons taking these for a long period tend to become fat.

Symptoms.—Health cannot be long maintained under excessive obesity, for the increase in bulk of the body, rendering exercise more difficult, leads to relaxation and defective nutrition of muscle, while the accumulations of fat in the chest and abdomen occasion serious embarrassment to the functions of the various organs in those cavities. In general, the mental activity of the highly corpulent becomes impaired, although there have always been many notable exceptions to this rule, especially so with those people who lead an easy life.

In fat people the tissues of the body generally are of poor quality. The corpulent are at least as liable as the spare to be attacked by acute diseases, and they succumb much more readily to them than do the latter. A fever or other sharp illness is, however, sometimes beneficial to a corpulent person, in so far as it reduces his unnecessary fat, and enables him to make a fresh start, and, by judicious means, prevent its reaccumulation. Gout and diabetes, which are both, like corpulence, the result of defective oxidation processes, are apt to arise in stout and overfed people. Various skin conditions, such as eczema, and particularly a chafed and painful condition of the skin at folds where two surfaces meet, are also troublesome.

Treatment.—For the prevention of corpulence and the reduction of superfluous fat, many expedients have been resorted to, and numerous remedies recommended. These have embraced such regimen as bleeding, blistering, purging, starving, the use of different kinds of baths, and of drugs innumerable, most of which means have been found to fail in accomplishing the desired object.

The drinking of vinegar was long popularly supposed to be a remedy for obesity. Another medicinal agent which has been proposed is the *liquor potassæ*. This medicine, which is recom-

mended on the ground of the chemical affinity of the alkalies for fats, is directed to be taken in teaspoonful doses in milk two or three times a day, at the same time that a restricted diet and abundant exercise are enjoined. But even this plan, though occasionally yielding good results, cannot be said to have been widely successful.

Other drugs have been successfully used. Among these, iodide of potassium forms the basis of several proprietary remedies. Iron in various forms is essential in those forms of corpulence found particularly in young women and caused by anemia, and its administration, accompanied by the other means requisite for this condition, is quickly attended by good results. Extract of thyroid gland is the remedy necessary in the disease known as myxedema, and in some cases of corpulence related apparently to this disease, its use has been of benefit.

Of far greater importance than any drugs is the question of the regulation of habits as to diet, exercise, and sleep.

The Salisbury Treatment.—Under this system, the person lives upon an entirely meat diet, consuming daily during a week or ten days about three pounds of lean beef, boiled, roasted, or minced according to taste. The meat is divided into three meals every day, and each meal is preceded by a copious drink (one pint) of hot water. After the week of treatment has elapsed, the person gradually reverts to an ordinary diet, avoiding thereafter certain forbidden articles. This method is often very successful, but is quite inadmissible for any one of gouty tendency or suffering from Bright's disease.

The Schrot Treatment was instituted by a Silesian peasant of that name, and consisted of a régime in which the persons under treatment were restricted in diet to stale bread and a limited amount of water. It was practically a starvation cure, and is very successful, though limited in usefulness to the strong and robust.

The articles of diet which are admissible to a person striving to reduce his excess of adipose tissue include the following: lean meat, fish, sweetbread, clear soup, fowls, game, eggs, cheese, green vegetables, fresh fruit, toast, skimmed milk, and buttermilk, which has been specially recommended by some. Alcohol should be avoided, and tea and coffee partaken of sparingly.

DISEASES OF THE RECTUM

The rectum is the last part of the large intestine. It pursues a more or less straight course downward through the cavity of the pelvis, lying against the sacrum at the back of this cavity. The opening to the exterior is known as the "anus."

Owing to the fact that this part of the intestine is more exposed to external influences than the rest of the bowels, and that it forms the place of lodgment of the stools prior to the evacuation of the bowels, and is therefore often subject to considerable irritation, the rectum is specially liable to various diseases.

Absence of an Opening may occur in newly born children, and unless the condition be relieved by operation within a few days, the child dies.

Itching at the anal opening is often very troublesome, sometimes maddening. It may be due to slight abrasions, the presence of threadworms, piles, and sometimes sexual irregularities.

It is to be treated by the remedies suitable for piles if there be any congestion present, and especially if the condition gets worse after any stimulants, and when the sufferer begins to get warm in bed. All stimulants, mustard, and pepper must be avoided in the diet. After evacuation of the bowels, the part should be washed with water and no paper used; a soothing lotion, such as calamine or carbolic lotion, should be applied night and morning, or an ointment of oxide of zinc, cocaine, or morphia.

Ulceration may occur here in the course of tubercular disease of the bowels, in dysentery, or even as the result of the constant irritation due to long-continued constipation. Ulcers in this locality cause a discharge of matter and frequently streaks of blood mixed with the motions. If the ulcer last a long time, it may lead to narrowing and obstruction of the bowel.

Abscess in the cellular tissue at the side of the rectum, known from its position as an ischio-rectal abscess, is fairly frequent. It often arises at a late stage in the course of consumption, and is a serious sign with regard to hope of ultimate cure of the disease. It may also arise, like an abscess elsewhere, as the result of injury, exposure to cold, and other debilitating influences. In any case it is likely to produce a fistula.

Fistula, or Fissure, is a very troublesome condition, and is kept from healing by the constant entrance into it of foul material from the bowel. It is only to be cured by dividing the tissues which separate it from the bowel, and each day, after the bowels move, packing the wound in such a way as to compel it to heal gradually from its deepest part. The process of healing is, therefore, a very tedious one.

Prolapse or protrusion of the bowel is a very common complaint, particularly in weakly children. In slight cases, where a ring of bright red mucous membrane half an inch or an inch in width protrudes as the result of straining at stool, the condition is generally easily curable by care. Any irritable condition of the bowels due to diarrhea, constipation, worms, etc., must be removed and the evacuations regulated by diet and laxatives, so as to avoid all straining. Each time the bowels move, the protruded portion must be returned by steady pressure with a cloth or sponge wrung out of cold water. If the bowel comes down when the child runs about, the wearing of a suitable pad is necessary, and the child must lie down for some time each day. Various astringent injections are also used, and the general health is attended to by tonics and other suitable treatment. When the protruded part is very large and the condition does not yield to simple treatment, it is remedied by operation.

Tumors of small size situated on the skin near the opening of the bowel, and consisting of nodules, tags of skin, cauliflower-like excrescences, etc., are very common, and may give rise to pain, itching, watery discharges, etc. These are easily removed if necessary.

Polypus occasionally develops within the rectum, and may give rise to no pain, though it causes frequent discharges of blood. Like a polypus elsewhere, it may often be removed by a very slight operation.

Cancer of the rectum is fairly common, this part of the bowel being one of the chief sites of this disease. It is a disease of later life, seldom affecting young people, and its appearance is generally insidious. The tumor begins commonly in the mucous membrane, its structure resembling that of the glands with which the membrane is furnished, and it quickly infiltrates the other coats of the intestine and then invades neighboring organs. Secondary growths in most cases occur soon in the lymphatic glands

within the abdomen, and in the liver. As already stated, the symptoms appear gradually. Diarrhea, alternating with attacks of constipation, and, later on, discharges of blood or of thin blood-stained fluid from the bowels, together with increasing thinness and weakness, and pains about the lower part of the back and down the legs, form the usual complaints. Upon examination, the tumor can be felt projecting from one side or in a ring-form into the interior of the bowel. These cases are usually far advanced before they give rise to much disturbance, and little can be done by way of cure.

TUMORS OR CANCER OF THE BREAST

The breast is one of the organs most frequently attacked by cancer. Immediately a woman discovers a small nodule in her breast she should consult a surgeon. If the swelling be not cancer—and usually it is not—her mind will be relieved, and the treatment, whether by operation or not, will not in general necessitate the removal of the breast.

EMBOLISM

Embolism means the plugging of a small blood-vessel by some material which has been carried through the larger vessels by the blood-stream.

BLOOD PRESSURE

Many conflicting statements regarding high blood pressure have appeared from time to time in the daily papers and various periodicals. From a commercial point of view, the life insurance companies have seen fit to reject many applicants on account of the presence of one high blood pressure reading during the regular examination of applicants for life insurance. Should the applicant at this examination show a blood pressure over 150 mg. he is almost immediately looked upon as a bad risk; whereas a subsequent examination might show a reading of 140.

Many factors are responsible for the variations of blood pressure in an individual, such as emotional disturbance, worry, excitement, overeating, hardening of the arteries, etc. While all these factors may exist in an individual, he still may not have a high blood pressure. The presence of certain chemical substances in the blood has been considered as being responsible for changes in the blood pressure, but nothing definite has as yet been proven as the direct cause of high blood pressure.

Some persons in perfectly normal health show a persistently low blood pressure of 110 to 120; while others in apparently good health may run between 145-160. In both cases the heart and blood vessels appear to be normal in every respect.

The integrity of the function of the glands of internal secretion, viz: the Adrenals, Thyroid and Pituitary must be assured. Experimentally extracts from these glands, when injected into the body of animals as well as individuals, bring about certain very marked and definite as well as constant changes in the blood pressure.

So valuable have these extracts become that their use is indicated in the treatment of shock due to hemorrhage where the blood pressure has suddenly been lowered to a dangerous point.

A persistently low blood pressure is more to be feared and should be looked upon as a more serious disturbance than a high blood pressure. Where this does exist, immediate and appropriate treatment should be instituted.

In the presence of persistently high blood pressure the observance of the following suggestions will be found most valuable: FIRST: Avoidance of all forms of mental worry and excitement. SECOND: The diet should be light and consist of such foods as are easily digested by the patient. As meats are more difficult of digestion, it is advisable that they be eliminated from the diet, as well as all forms of stimulants, such as alcohol, strong tea, and coffee.

More important than the *quality* of the food taken is the quantity that is eaten. Overeating, more often than any one thing, is responsible for the gradual increase in blood pressure.

The bowels should be kept well flushed with some form of saline water, and an occasional dose of Calomel, 2 to 5 grains at bedtime, followed by a tablespoonful of Epsom Salts in a ½ cupful of hot water the following morning. This procedure will be instrumental in lowering the blood pressure 10 to 20 points.

The function of the Kidneys should be carefully attended to. Frequent draughts of distilled water, 4 to 6 glasses daily, to promote the flow of urine, will be found helpful.

During a sudden attack of rise of blood pressure in a person, where the face becomes blue and breathing becomes very difficult and death seems imminent, immediate relief will be obtained by the withdrawal of 10 to 12 ounces of blood from the patient by venesection. This is readily accomplished by puncturing the vein at the elbow with a large needle under strictly aseptic conditions.

Very often after a procedure of this kind the patient will be relieved for several months, and with proper care in diet will enjoy the best of health.

The use of drugs for the relief of high blood pressure has not met with the best results. The most useful is Iodid of Potash, 10 to 40 grains three times a day in water or milk. This drug is best taken in the form of a saturated solution and taken in doses from 10 to 40 drops as above described.

DICTIONARY OF MEDICAL TERMS

A

Abdomen. The belly.
Abdominal. Relating to the abdomen.
Abdominal cavity. The cavity of the belly.
Abductor. A muscle that draws out or away.
Aberration. Deviation from the normal.
Abnormal. Not natural.
Abort. To miscarry.
Abortion. Enforced premature delivery.
Abortive. Causing abortion.
Abrasion. A wearing or rubbing off of the skin.
Abscess. A cavity filled with pus.
Absorbent. Gland or vessel which absorbs by suction; a drug producing absorption of diseased tissue.
Abstemious. Temperate in the matter of diet.
Abstinence. Self-denial as regards diet.
Accelerate. To hasten.
Accentuate. To lay stress upon.
Access. The onset of a disease.
Accouchement. Childbirth; delivery.
Acid. Sour; pungent.
Acidity. Sourness; sharpness.
Acme. The climax or crisis of a disease.
Acne. Irritation and inflammation of the sebaceous glands due to withheld secretion.
Aconitum. Poisonous leaves and roots of monk's-hood; sedative for the heart.
Acrid. Sharp; bitter.
Acute. Sudden or severe.
Adenitis. Inflammation of a gland.
Adenoid. Tissue in the naso-pharynx.
Adenosis. An abnormal condition of the glands.
Adhesive. Clinging to.
Adipose. Oily; fatty.
Adynamia. Loss of energy or vital power.
Affinity. Relationship; attraction.
Affusion. A pouring or sprinkling of a liquid upon a part of the body.
Agenesia. Imperfect or abnormal development.
Agenesis. Absence of reproductive power.
Agent. An active element producing changes in the body.
Agglutinative. Having adhesive properties.
Agglutinin. A substance in the blood-serum having the property of agglutinating bacteria.
Agility. Suppleness; liveliness.
Agitation. Excitement; discomposure.
Albuginea. White coat of the eye.
Albumen. The white of an egg.
Albumin. A proteid animal or vegetable which can be dissolved in water and curdled by heat.
Albuminoid. Having the characteristics of albumin.
Alimentary. Nourishing.
Alimentary canal. The digestive tube extending from the lips to the anus, with its accessory glands.
Alkali. A substance uniting with acids to form salts, etc.
Alterative. A medicine which gradually restores health without any perceptible increase of the circulation, perspiration, or urine.
Alveolar. Pertaining to the socket of a tooth.
Alveolus. Air-cell of the lung; socket of a tooth.
Alvine. Pertaining to the intestines.
Amaurosis. Partial or total loss of vision.
Amelioration. Improvement.
Amenorrhea. Irregularity or suppression of the menses.
Amnesia. Defect of memory.
Amnion. A sac or bag in which the fetus is inclosed.
Amniotic liquid. The fluid which surrounds the fetus in the womb.
Amorphous. Without regular form.
Analgesic. A medicine producing inability to feel pain.
Analysis. Examination of a substance in its separate forms or constituent parts.
Anaphia. Deficient sense of touch.
Anasarca. Dropsy affecting the entire body.
Anastomosis. The joining together of veins and arteries.
Anatomical. Pertaining to anatomy.
Anatomy. The science which treats of organic bodies and their dissection.
Anemia. Impoverished blood.
Anesthesia. A condition of insensibility or loss of feeling.
Anesthetic. A substance which produces anesthesia.
Aneurism. A tumor consisting of a dilated artery.
Angina. A sense of choking or suffocation.
Angina tonsillarus. Inflammation of the tonsils.
Angina trachealis. Inflammation of the windpipe.
Anginose. Affected with angina.
Animalcule. An organism so small as to require a microscope to be seen.
Ankylosis. Pertaining to stiff or useless joints.
Annulated. Surrounded by rings.
Anodyne. A medicine which relieves pain and induces sleep.
Antacid. A preparation which neutralizes acidity.
Antalkali. An agent neutralizing alkalies.
Anterior. Situated in front.
Anthelmintic. A remedy killing or expelling worms.
Antidote. A medicine which offsets the effect of poison.
Antiemetic. A medicine relieving nausea.
Antifermentative. Preventing fermentation.
Antimorbific. Opposing disease.
Antiperiodic. Medicine curing diseases of a periodical nature.
Antiphlogistic. A medicine or treatment which allays inflammation.
Antipruritic. Relieving the sensation of itching.
Antipyretic. An agent reducing the temperature of fever.
Antiscorbutic. A remedy for scurvy.
Antiseptic. Having power to counteract or destroy putrefaction.
Antispasmodic. Tending to relieve spasms.
Anus. The extremity of the rectum.
Aperients. Laxatives.
Apex. The summit or top.
Aphasia. Partial or complete loss of power of speech.
Aphasia, amnesic. Loss of memory for words.

Aphasia, ataxic. Inability to articulate.
Aphonia. Loss of power of speech.
Apnea. Breathlessness.
Aponeurosis. Membranous expansion of muscles and tendons.
Apoplexy. Symptoms resulting from rupture of a blood-vessel.
Appendage. That which is attached to an organ, being a part of it.
Appendicitis. Inflammation of the appendix vermiformis.
Approximate. Closely resembling.
Arcanum. A secret medicine; a cure-all.
Area. Any space with boundaries.
Areola. Colored circle around the nipple; ring-like discoloration.
Aroma. Volatile odors of vegetables.
Aromatic. Medicine possessing an agreeable odor and spicy, pungent taste.
Aromatic tincture. An alcoholic solution of an aromatic powder.
Arteritis. Inflammation of an artery.
Artery. A vessel carrying blood from the heart.
Arthritic. Relating to inflammation of a joint; gouty.
Arthrodia. A joint which can be moved in any direction.
Articulated. Divided into joints.
Ascaride. A species of intestinal worms.
Ascites. Dropsy of the abdomen.
Asphyxia. Suffocation; apparent death.
Assimilate. The converting of food into the substance of the body.
Asthenia. Loss of strength.
Asthenic. Relating to debility or loss of strength.
Asthenopia. Weakened or painful vision.
Asthma. Difficult breathing with a feeling of oppression.
Asthmatic. Subject to asthma.
Astringent. A medicine which causes contraction of organic tissue or which checks discharge.
Atomizer. An instrument which transforms a liquid into a spray.
Atony. Loss of muscular power.
Atrophy. The wasting of a part due to lack of nutrition.
Attenuated. Wasted or weakened.
Attenuation. A thinning or reduction in size.
Auditory. Relating to the organs of hearing.
Auricle. Upper heart chamber; outer portion of ear.
Auricular. Relating to the ear or cardiac auricle.
Auscultation. Method of detecting disease by listening to the sounds produced by the heart, lungs, etc.
Autopsy. Inspection of the different parts of the body after death.
Axilla. The armpit.
Azote. Nitrogen; one of the composite parts of the atmosphere.

B

Bacteria. Microbes.
Bacterial. Relating to bacteria.
Bactericidal. Destroying bacteria.
Balsam. An aromatic substance obtained from certain trees.
Balsamic tincture. Tincture of balsams.
Barley-water. A nourishing drink obtained from an infusion of barley.
Belching. Expelling gas from the stomach through the mouth.
Bibulous. Having the power to absorb water.
Bicapitate. Having two heads.
Bicellular. Composed of two cells.
Biennial. Occurring every two years.
Biforate. Having two perforations.
Bifurcate. Separated into two branches.
Bifurcation. Division into two parts.
Bile. Fluid secreted by the liver.
Bilious. Having a disordered liver.
Biologist. One versed in biology.
Biology. The science of life or living things.
Biolysis. The devitalizing or destruction of living tissue.
Biometer. An instrument used in measuring life sounds.
Biometry. The estimation of the probable duration of any given life-form.
Bioscopy. Examination of the body to determine whether life is extinct.
Bland. Mild and soothing.
Blepharism. Spasmodic affection of the eyelid.
Boil. A localized inflammation of the skin containing pus.
Bovine. Pertaining to the ox or cow.
Bowel. The intestine.
Brachial. Relating to the arm.
Bronchia. The connection between windpipe and lungs.
Bronchitis. Inflammation of the bronchial tubes.
Bronchopneumonia. Inflammation of the lungs commencing at the bronchi.
Bubo. Swelling and inflammation of the lymphatic glands of the groin.
Bulimia. State of excessive, morbid hunger, sometimes occurring in idiots and insane persons.
Bullation. Inflation.
Bursa. A fluid-filled sac.
Bursitis. Inflammation of a bursa.
Buttock. The rump.

C

Cachectic. Affected with cachexia; ill-conditioned.
Cachexia. A term used to designate any morbid tendency or depraved condition of general nutrition.
Calcareous. A substance containing lime.
Calculus. A gravel or stone-like concretion which forms in the bladder and kidneys.
Callous. Tough; hard.
Callus. Thickened skin; a substance which forms around a fracture, serving to unite the bones.
Caloric. Heat energy.
Calory. A unit of heat.
Canker. An ulceration of the mouth.
Canthus. An angle formed by the eyelids.
Capillary. A tiny, minute blood-vessel, similar to a hair.
Capsicum. Cayenne pepper.
Capsule. A membranous sac which incloses a part of the body or an organ; a small shell composed of glycerine and gelatine, both parts fitting together like a box and cover, used to administer nauseous and repulsive medicines.
Carbon. Charcoal.
Carbonated. Containing carbonic acid.
Carbuncle. A large and painful gangrenous boil or ulcer.
Carcinoma. A malignant tumor; cancer.
Cardia. The heart.
Cardiac. Pertaining to the heart.
Cardiology. Science of the heart.
Caries. A chronic inflammation of bone.
Carminative. A medicine expelling wind from the stomach and bowels.
Cartilage. Gristle.
Catamenia. The menses.
Cataplasm. A poultice.
Catharsis. Purging.
Cathartic. A medicine which freely opens the bowels.
Catheter. A tube-like instrument for evacuating the bladder.
Caustic. A substance that destroys living tissue.
Caustic, lunar. Silver nitrate formed into sticks.
Cauterize. To apply caustic.

Cautery. A substance or instrument used to burn or disorganize a part.
Cecum. The blind pouch at the head of the large intestine.
Cerates. Medicinal substances of which wax forms a part.
Cerebellum. The lower part of the brain.
Cerebral. Relating to the brain.
Cerebritis. Inflammation of the brain.
Cerebrospinal. Pertaining to the spine and brain.
Cerebrum. The chief portion of the brain, occupying the entire upper part of the skull.
Cerumen. The wax of the ear.
Cervix. The neck or any neck-like part; the neck of the womb.
Cessation. Ceasing from action.
Chalybeate. Containing iron.
Chancre. The primary or first stage of syphilis.
Chancroid. A non-syphilitic chancre.
Chancrous. Of a similar nature to chancre.
Chemosis. A swelling of the eye, causing the eye to project.
Chloasma. Deposit of pigment in the skin.
Chloretone. A white crystalline substance used as a local anesthetic and hypnotic.
Chlorine. A non-metallic element, highly irritative to the skin.
Cholagogue. A medicine causing a discharge of bile.
Choleric. Easily irritated; having an overabundance of bile.
Chorea. Involuntary muscular twitchings; St. Vitus's dance.
Choreoid. Relating to chorea.
Choroid. The second or vascular tunic of the eye.
Chronic. Long continued.
Chyle. Milky fluid formed from food by digestion.
Chyme. Food that has undergone gastric digestion.
Cicatrix. A scar.
Cicatrization. Healing process or scar formation.
Cilia. The eyelashes.
Circumscribed. Well defined; distinct from surrounding parts.
Citrate. A salt of citric acid.
Clarificant. A substance used for the purpose of clearing solutions.
Clarified. Purified; made clear.
Clinic. A gathering of instructors, students, and patients, for the study and treatment of disease.
Clonic. Convulsive condition of the muscles.
Coagulate. To form a clot; to curdle.
Coalesce. To unite, as separate parts into one body.
Coaptation. The adjustment of the edges of fractures.
Codeine. One of the alkaloids derived from opium.
Coil-gland. Sweat-gland.
Coition. The union of the sexes in the generative act.
Colliquative. Consisting of excessive discharges.
Collodium. A dressing for wounds, made by dissolving guncotton in ether and alcohol.
Colloid. Like glue; a non-crystallizable organic substance.
Colloid cancer. Cancer with colloid degeneration.
Colloid cyst. A cyst with jelly-like contents.
Collutorium. A gargle; a mouth-wash.
Collyrium. A lotion for the eyes.
Coloboma. A fissure, especially of portions of the eye.
Colocentesis. Surgical puncture of the colon.
Coloenteritis. Inflammation of the large and small intestines.
Colon. Portion of the large intestine.
Colostrum. First breast-milk after childbirth.
Coma. A stupor; an abnormally deep sleep.
Comatose. In a state of coma.
Comedo. Blackhead.
Comminution. The process by which a solid body is reduced to pieces.
Commissure. A uniting or joining together.
Compensation. The counterbalancing of a defect of function or structure.
Complexus. The totality of symptoms or signs of a morbid condition.
Complication. A combination of diseases or morbid conditions.
Compress. Folded cloths, wet or dry, applied firmly to the part, for relief of inflammation or to prevent hemorrhage.
Concave. Hollow.
Concentrated. Made stronger; condensed.
Concentric. Having a common center.
Condiment. Seasoning, to give relish to meat or other food.
Conductive. Having the power to transfer force or material from one part to another.
Conduit. Any medium of transmission, such as nerves and blood-vessels.
Condyle. A rounded prominence, occurring at joints.
Confluent. Running together.
Congenital. Existing at birth.
Congestion. Distention of parts caused by an abnormal accumulation of blood in them.
Conjugation. A form of reproduction.
Conjunctiva. Mucous membrane of the eye.
Conjunctivitis. Inflammation of the conjunctiva.
Constipation. An inactive condition of the bowels.
Constriction. A drawing together of parts owing to contraction of the muscles.
Contagion. The infection of a disease by contact.
Contagious. Spread of disease directly from one person to another.
Contagium. Part of a disease transmitted.
Contamination. Taint; pollution.
Contiguity. Contact.
Continuity. Uninterrupted connection.
Contorted. Twisted.
Contraction. A drawing together, causing shrinkage.
Contraindicated. Having the effect of implying the opposite.
Contusion. A bruise.
Convalescence. The period of recovery from illness.
Convergence. To tend to come together to a common point or center.
Convolution. A fold, twist, or coil of any organ.
Convulsion. A spasm or fit.
Coössify. To form one bone.
Copious. In great quantities.
Copulation. The act of sexual intercourse.
Coriaceous. Leathery.
Cornea. The transparent portion of the eyeball.
Corneal. Relating to the cornea.
Corneo-iritis. Inflammation of the iris and cornea.
Coronary. A term applied to vessels, nerves, or attachments that encircle a part or organ.
Corporeal. Consisting of material substance.
Corpulency. Fleshiness.
Corpus. The human body.
Corpus luteum. The yellow body formed in the ovary after the egg has escaped.
Corpuscle. A cell.
Correlation. Relationship.
Corroborant. A tonic or medicine that strengthens.
Corrosive. A substance which destroys organic tissue.
Cortex. The external gray layer of the brain.
Costal. Pertaining to the ribs.
Costiveness. Constipation.
Counter-irritant. A medicine relieving irritation in one organ by increasing it in another.
Cranial. Pertaining to the skull.
Cranium. The skull or bony case of the brain.

Cretinism. A disease characterized by goiter, idiocy, and deficient development of the organism.
Crisis. The turning-point in a disease.
Crude. Raw; in the natural state.
Crypt. A glandular cavity; a small sac.
Cryptitis. Inflammation of a crypt.
Curd. The coagulum of milk.
Cuticle. The scarf-skin.
Cutis. The true skin.
Cyanopia. A perverted state of the visual powers, in which all objects appear blue.
Cyanosis. A bluish discoloration of the skin, caused by local or general circulatory diseases.
Cyst. A membranous sac containing fluid.
Cystitis. Inflammation of the bladder.

D

Debilitant. A medicine that weakens.
Debilitated. Weakened.
Debility. Weakness.
Decidua. A thin, external membrane within the womb, cast off after childbirth.
Deciduous. Falling off; not permanent.
Decoction. A liquid preparation obtained by boiling vegetable substances in water.
Decomposition. Decay.
Decrepitude. The feebleness of old age.
Defecation. The discharge of feces; evacuation of the bowels.
Defervescence. Periods during the course of fever in which the temperature falls.
Deformity. Abnormal shape or structure of any part of the body.
Degeneration. Deterioration in the structure of a tissue, organ, or cell.
Dejection. The discharge of the bowels; also a state of despondency.
Deleterious. Injurious.
Deliquescent. Dissolving or melting away.
Deliquium. Mental decay or failure of the mind; fainting.
Delirium. Disorder of the mind.
Delusion. False judgment of objective things, the result of an abnormal condition of the brain.
Demarcation. A line of separation, as between gangrenous and healthy tissue.
Demented. Insane.
Demulcent. A medicine having a soothing effect and allaying inflamed or irritated parts.
Dentition. The arrangement and evolution of the teeth.
Deobstruent. A medicine which removes functional obstructions.
Deodorant. A substance that kills bad odors.
Depletion. The process of lessening the quantity of any tissue or fluid of the body.
Depressant. A medicine that retards the action of an organ.
Depression. An indentation or hollow; low spirits.
Depuration. Purifying; cleansing.
Derangement. Disorder of the mind.
Dermic. Relating to the skin.
Dermopathy. Treatment of diseases of the skin.
Desiccate. To remove the moisture from solids.
Detergent. A medicine which cleanses.
Deteriorate. To become impaired in quality.
Diagnosis. The art of determining the nature of a disease by its symptoms.
Diaphoretic. A medicine which induces sweating.
Diaphragm. The muscular wall between the thorax and the abdomen.
Diffusible. Susceptible of being rapidly spread.
Dilatation. Enlargement of an organ or vessel.
Diminution. The act of making smaller.
Disintegration. Breaking up; decomposing.
Dissemination. A scattering as applied to disease germs.
Diuresis. Increase in secretion of urine.
Diuretic. A medicine that increases the flow of urine.
Drastic. A powerful and irritating purgative.
Dyslalia. Impairment or difficulty of speech.
Dyslogia. Inability to reason.
Dysopsia. Defective or painful vision.
Dysphoria. Mental anxiety; restlessness.
Dyspnea. Labored or difficult breathing.
Dysuria. Painful or difficult urination.

E

Ecbolic. A medicine that produces abortion.
Ectoderm. The primitive outer wall of the body.
Ectropion. Turning out of the eyelids.
Effete. Barren.
Effluvium. Odor; exhalation.
Electuary. A medicine the ingredients of which are mixed with syrup.
Emetic. A medicine which causes vomiting.
Emmenagogue. A medicine which promotes the menstrual flow.
Emollient. A remedy which soothes.
Empyema. A gathering of pus, blood, etc.
Encephalic. Pertaining to the brain.
Endemic. A disease confined to a certain location.
Endocarditis. Inflammation of the lining membrane of the heart.
Engorgement. Over-distention of a part with blood.
Enteric. Relating to the intestine.
Enteritis. Inflammation of the intestine.
Ephemera. A fever of one day's duration.
Epidermis. The outer layer of the skin.
Epiglottis. A thin cartilaginous plate or valve which aids in preventing food and drink from going into the breath-passage.
Epispastic. A substance which inflames the skin, causing a blister.
Erosion. Ulceration.
Eructation. Belching.
Erythema. A superficial redness of the skin.
Escharotic. A substance that destroys living tissue and forms a scab.
Esophagus. The canal extending from the pharynx to the stomach.
Etiology. The science of the causes of disease.
Evacuant. A medicine causing evacuation of the bowels.
Evulsion. The forcible tearing away of a part.
Exacerbation. Increased severity of symptoms.
Excipient. Any substance used to give an agreeable or convenient form to the ingredients of a prescription.
Excoriation. Abrasion or removal of a limited portion of the skin.
Excrescence. An abnormal growth on the body.
Exfoliation. The scaling off of dead tissue.
Expectorant. A remedy that makes the discharge of mucus and other substances from the air-passages more easy.
Exsiccation. The process of drying by heat.
Extravasation. The passing of blood, serum, etc., into adjacent tissues of the body.
Exudation. A morbid filtration or oozing out of blood; sweating.

F

Fallopian tubes. The tubes connecting the womb and ovaries.
Faradic. Relative to induced electric currents.
Faradization. The treatment of a nerve with faradic or induced currents of electricity.
Fascia. A thin covering of the muscles.
Fasciculi. Small bundles of muscle-fibers.

Fauces. The back part of the mouth.
Febricula. A slight fever of short duration.
Febrifacient. Causing fever.
Febrifuge. An agent that dispels fever.
Febrile. Pertaining to fever.
Feces. The discharge from the bowels.
Fetid. Having a strong, offensive odor.
Fiber. A thread-like structure.
Fibrine. A native albumin or proteid that, becoming solid in shed blood, plasma, and lymph, causes coagulation of these fluids.
Fibrinous. Composed of fibrine.
Fibroid. Having a fibrous structure.
Fibrosis. The development of fibrous tissue.
Fibrous. Consisting of fibers.
Fibula. The long, slender outer bone of the leg.
Filament. A small, thread-like structure or part of an organ, as a muscle, nerve, or tendon.
Filter. An apparatus for straining liquids.
Fissure. A groove or cleft.
Fistula. An abnormal, tube-like passage in the body.
Flaccid. Flabby.
Flatulence. Wind in the stomach and intestines.
Flatus. Gases in the digestive tract.
Flexura. A curve or bend in an organ.
Flushing. Forcibly washing out; a redness of the face.
Flux. An abnormal discharge from the bowels.
Follicle. A small cavity or sac.
Fomentation. Heat and moisture through the application of cloths to reduce inflammation and allay pain.
Foramen. A perforation or opening, especially in a bone.
Formication. A crawling, creeping sensation.
Friable. Easily crumbled or broken.
Fulcrum. A support.
Function. The normal action of a part.
Furfuraceous. Scaly, as in a dandruff-covered skin.
Fusion. Liquefying a solid through heat.

G

Galvanism. Primary dynamic or current electricity.
Ganglion. An enlarged lymphatic gland; a separate, semi-independent nervous center.
Gangrene. Mortification; death of a local part.
Gastric. Relating to the stomach.
Gastricism. A gastric disorder such as dyspepsia.
Gastritis. Inflammation of the stomach.
Genital. Pertaining to the reproductive organs.
Genito-. Pertaining to the genital organs.
Germicide. An agent which destroys germs.
Germination. The development of a germ or seed.
Geromorphism. Appearance of old age in a young person.
Gerontic. Relating to old age.
Gestation. The period of pregnancy.
Glairy. Slimy.
Gland. A fleshy organ which secretes fluid.
Gleet. A mucous discharge from the canal of the bladder.
Glioma. A tumor composed of nerve-cells.
Globule. A small globe; a blood-corpuscle.
Glossa. The tongue.
Glottis. The opening into the windpipe, covered by the epiglottis.
Gluteal. Relating to the buttocks.
Gluteus. The large muscle of the buttocks.
Gnathitis. Inflammation of the jaw.
Goiter. Enlargement of the thyroid gland.
Gonyalgia. Pain in the knee-joint.
Gonyocele. A tumor or swelling of the knee.
Granular. Similar to small grains.
Granulation. The healing or covering of a wound with small elevations, looking like grains.
Groin. The depression between the trunk and thigh.
Grumous. Knotted; in granular masses.
Gullet. The passage from the mouth to the stomach.

H

Hallucination. A wandering of the mind.
Hectic. The fever of advanced disease.
Hectic flush. Reddening of the cheeks, as in tuberculosis.
Hematemesis. Vomiting of blood.
Hematinic. A medicine which increases the coloring-matter of the blood.
Hematoma. A tumor containing blood.
Hemicrania. Neuralgia of one half of the head.
Hemiplegia. Paralysis of one side of the body.
Hemoglobin. The coloring-matter of the red blood-corpuscles.
Hemoptysis. The spitting of blood, usually from the lungs.
Hemostatic. A medicine that stops bleeding.
Hepatic. Relating to the liver.
Hepatitis. Inflammation of the liver.
Herpes. An acute inflammatory eruption on the skin, with patches of blisters.
Humors. Any fluid of the body.
Hyaline. Resembling glass; transparent; crystalline.
Hydragogue. A purgative causing liquid discharges.
Hydrocele. A tumor in the sac which contains the testicles.
Hydrocephalus. Dropsy of the brain.
Hydropathy. Treatment of disease by the use of water.
Hydrothorax. Dropsy of the chest.
Hypercatharsis. Excessive purging.
Hyperemia. Excessive supply of blood.
Hyperesthesia. Excessive sensibility.
Hypermetropia. Far-sightedness.
Hypermnesia. Abnormal powers of memory.
Hyperosmia. An abnormally acute sense of smell.
Hypertrophy. Abnormal increase in size of an organ or a part.
Hypnotic. A medicine which induces sleep.
Hypochondriac. A person who imagines himself suffering from bodily disease.
Hypodermic. Injection of medicines through the skin.
Hypogastrium. The lower abdomen.
Hypotrophy. A defect in the tissue-building powers of the organism.

I

Ichor. A watery discharge from an ulcer.
Icteroid. Resembling jaundice.
Idiopathic. Not dependent upon another disease.
Idiosyncrasy. Individual peculiarity.
Ileum. Lower portion of small intestine.
Immune. Safe from attack; protected by vaccination or previous similar illness.
Impervious. Impenetrable; not permitting a passage through.
Impetigo. An acute pustular inflammation of the skin.
Inanition. Weakness or exhaustion from improper nourishment.
Incubation. The time elapsing from exposure to a disease until it matures.
Indurated. Hardened.
Inertia. Inactivity; sluggishness.
Infection. Communication of disease.
Inflation. Expansion with air.
Infusion. A medicine made by steeping a substance in a liquid.
Ingestion. The introduction of food into the body.

Inguinal. Relating to the groin.
Innervation. The supply of nervous influence bestowed upon any organ or part.
Inoculation. Injection of contagious matter into the skin or flesh.
Insidious. Not obvious; hidden; treacherous.
Insufflation. The filling of any cavity with air, gas, or vapor.
Integument. A covering, especially the skin.
Intercostal. Between the ribs.
Intermittent. Occurring at intervals.
Intima. The innermost coat or lining of the heart and blood-vessels.
Intimitis. Inflammation of an intima.
Intraocular. Within the globe of the eye.
Intravenous. Within a vein.
Introversion. Turning inward.
Intussusception. The entangling of one part of the intestine with another part.
Inunction. The act of rubbing an oily or fatty substance into the skin.

J

Jactation. Extreme restlessness in disease.
Jecur. The liver.
Jejunitas. Fasting.
Jejunum. The upper two fifths of the small intestine.
Jugal. Uniting or connecting.
Jugular. Pertaining to the throat.
Jugulation. The swift and sudden shortening of an attack of disease by medicinal measures.

K

Kenophobia. Morbid fear of open places or spaces.
Kephyr. A variety of fermented milk.
Keratitis. Inflammation of the cornea.
Kerion. A parasitic scalp disease.
Kinesipathy. The gymnastic treatment of disease.
Kinesthesis. The perception of muscular movement.

L

Labia. The lips.
Lachrymal. Pertaining to tears.
Lamina. A thin layer.
Lamination. Arrangement in layers.
Lancet. A two-edged surgical knife.
Lactometer. An instrument used to determine the proportion of cream in milk.
Laryngotomy. An operation on the larynx.
Larynx. The organ of voice.
Lassitude. Languor; weakness.
Latent. Not visible or apparent; concealed.
Laxative. An agent that loosens the bowels; a mild purgative.
Leech. A blood-sucking worm found in fresh waters.
Lesion. An injury, hurt, or wound in any part of the body.
Lethargy. Drowsiness.
Lichen. A papular, inflammatory condition of the skin.
Lientery. A special form of diarrhea.
Ligament. A band of flexible connective tissue.
Ligation. The operation of tying, as of an artery.
Ligature. The material used for tying.
Lincture. A syrup-like medicine, to be taken by licking or sucking.
Lithontriptic. A medicine which destroys stone in the bladder.
Lithotomy. Removal of stone from the bladder by cutting.
Lithotrity. The operation of breaking a stone in the bladder into small pieces capable of being expelled.
Livid. Discolored from congestion or contusion.
Lobe. The round projecting part of an organ.
Lobule. A small lobe.
Lochia. Evacuations which follow childbirth.
Lumbar. Relating to the loins.
Lymph. A colorless alkaline fluid in the lymph-tubes of the body; material used in vaccination.
Lymphatics. Vessels which carry lymph.

M

Maceration. Softening by steeping in fluid.
Malassimilation. Imperfect nutrition; defective digestion.
Malformation. Abnormal development or formation.
Malignant. Endangering life.
Mamma. Breast of the female.
Mastication. The act of chewing food.
Mastitis. Inflammation of the breast.
Matrix. The cavity in which anything is formed; the womb.
Meatus. A passage; the opening through which the urine passes.
Medulla. A fatty substance or marrow occupying certain cavities; the spinal cord.
Meninges. The membranes covering the brain.
Meningitis. Inflammation of the membranes of the brain.
Menopause. The termination of the menstrual life.
Metabolism. A change in the intimate condition of cells.
Metamorphosis. Transformation.
Metastasis. The change in manifestation or character of a disease.
Miasma. Atmospheric germs.
Micrology. The science of microscopic objects.
Microscopic. Very small or minute.
Migraine. A severe headache confined to one side of the head, accompanied by nausea.
Mitral valve. A valve of the heart.
Molecule. The smallest quantity into which a mass of substance can be divided and retain its characteristic properties.
Molluscum. A skin disease characterized by pulpy tumors.
Morbific. Conducive to disease.
Morphea. A skin disease in which yellowish or brownish patches appear, leaving a scar upon their disappearance.
Mortification. Death of a part of the body through failure of nutrition.
Mucopuriform. Composed of pus and mucus.
Mucoserolent. Composed of serum and mucus.
Myalgia. Pain in the muscles.
Myelon. The spinal cord.

N

Nanism. Undersized condition due to arrested development.
Nanous. Dwarfed.
Narcotic. A medicine which induces sleep and allays pain.
Naris. The nostril.
Nasal. Relating to the nose.
Nasitis. Inflammation of the nose.
Nates. The buttocks.
Nausea. Sickness at the stomach, with inclination to vomit.
Necrosis. The death of cells surrounded by living tissue.
Nephritic. Pertaining to the kidneys.
Nephritis. Inflammation of the kidneys.
Nervine. A remedy that acts favorably on the nerves.
Neurilemma. The sheath incasing a nerve-fiber.
Neuroma. A nerve-tumor.
Nevus. A birthmark.

Nidus. A central point of infection.
Noctambulation. Sleep-walking.
Node. A swelling or protuberance.
Nosography. Description of diseases.
Nosologist. One who classifies disease.
Nosology. The science of diseases.
Nostalgia. Homesickness.
Nostrum. A quack or patent medicine.
Noxious. Harmful; poisonous.
Nuclear. Relating to the nucleus.
Nucleus. The controlling center of an organ or muscle.
Nutritive. Nourishing.

O

Obese. Corpulent.
Obesity. Excessive fat on the body.
Occipital. Relating to the back of the head.
Occlusion. The closing or blocking of an opening.
Oleaginous. Oily.
Olfaction. The sense of smell.
Olfactory. Pertaining to the sense of smell.
Opacity. Darkness; non-transparency.
Ophthalmoscope. A perforated mirror used for inspecting the interior of the eye.
Opiate. A preparation of opium; a hypnotic.
Optic. Relating to the eye.
Orbicular. Having a circular shape.
Orifice. An opening.
Orthopnea. A disease which permits breathing only when in an upright position.
Osseous. Bony; resembling bone.
Ossification. The process of change of flesh into bony substance.
Os uteri. The mouth of the womb.
Otoscope. Instrument for inspection of the ear.
Ovariotomy. Surgical operation on the ovaries.
Oxytocic. A drug that hastens childbirth.
Ozena. Nasal ulceration and fetid discharge.

P

Palate. The roof of the mouth and floor of the nose.
Palatitis. Inflammation of the palate.
Papilla. A reddish elevation of the skin or tongue.
Paracentesis. Puncture of the wall of a cavity.
Paraplegia. Paralysis of the lower portion of body.
Parasite. An organism that lives on or in another organism and obtains nourishment from it.
Parietal bones. Bones forming the sides and roof of the skull.
Parotid glands. The glands of the cheeks which secrete the saliva.
Parturient. Giving birth.
Parturition. The act of giving birth to young.
Pathogenic. Causing disease.
Pathognomy. The science of the signs by which disease is determined.
Pathology. The sum of the morbid conditions, processes, and results in the course of a disease.
Pectoral. A remedy for diseases of the lungs or chest.
Pedicle. The stalk of a tumor.
Peduncle. Any supporting part.
Pelvis. The bony cavity at the lower part of the body containing the womb, abdomen, rectum, etc.
Perflation. The act of blowing through.
Pericardium. The sac inclosing the heart.
Perineum. The floor of the pelvis.
Phagedena. Gangrenous, destructive ulceration.
Pharynx. The cavity back of the mouth and nose.
Phlebotomy. The opening of a vein for the purpose of blood-letting.
Phlegmon. Inflammation of the tissues.
Phlyctena. A blister.
Pigment. Organic coloring-matter.
Pith. The marrow of bones; the spinal cord.
Plasma. The fluid part of the blood and lymph.
Plexus. Network of fibers or nerves.
Potion. A dose.
Probe. Examination of a wound or sore by piercing with a sharp instrument.
Profunda. A deep-seated artery.
Prognosis. Judgment or opinion concerning the duration and termination of a disease.
Prolapsus. Falling down of a part.
Prophylactic. A medicine preventing the development of a disease.
Prostate gland. The organ surrounding the neck of the bladder.
Psoriasis. A chronic inflammatory skin disease.
Ptosis. A falling or drooping.
Purgative. A medicine producing free evacuation of the bowels.
Purpura. Hemorrhages into the true skin.
Purulent. Having the character of or forming pus.

R

Ramification. The branching and division of an organ or part.
Ramolescence. The softening of a part.
Reaction. Responsive action of an organ, tissue, or the system.
Recumbent. Reclining.
Recurrent. Returning from time to time.
Refrigerant. A medicine having cooling properties.
Regimen. The systematized use of food and sanitary arrangement of surroundings.
Regurgitation. Throwing back of the contents of a canal or vessel.
Relapse. The return of a disease during convalescence.
Remission. A subsidence of the symptoms of a disease.
Renal. Relating to the kidneys.
Residue. That which remains after a part has been removed.
Resolution. Dispersing of inflammation before pus is formed.
Resolvent. A medicine which disperses inflammation.
Respiration. Breathing.
Resuscitation. Bringing back to life.
Retching. Straining at vomiting without success.
Reticulated. Having net-like meshes.
Retina. Internal membrane of the eye.
Retinitis. Inflammation of the retina.
Retraction. Drawing backward; shortening.
Retroflexion. A bending backward.
Retrograde. Receding.
Retroversion. A turning backward.
Revivification. Renewal of life.
Revulsion. The reduction or withdrawal of blood from a diseased to a healthy part.
Rheum. A watery or catarrhal discharge.
Rubefacient. A medicine which reddens the skin.
Rupia. A syphilitic eruption characterized by ulcers.

S

Saline. Salty.
Sanies. A thin fluid of pus and blood discharged from ulcers.
aphena. One of two large veins of the leg.
Sciatic. Pertaining to the hip.
Scirrhous. Hard; knotty.
Scirrhus. A cancerous growth; a tumor.
Scleroderma. Hardened skin.

Sclerotic. Pertaining to the outer coat of the eye.
Scorbutic. Affected with scurvy.
Sebaceous. Pertaining to or appearing like fat.
Seborrhea. An abnormal secretion of the sebaceous glands.
Sedative. A medicine which has a soothing, quieting effect.
Semiflexion. Bending half over.
Senile. Pertaining to old age.
Sepsis. Infection of the system through putrid matter in the blood.
Septicemia. Fever due to blood-poisoning.
Septum. A dividing membrane or wall.
Sequela. Abnormal condition resulting from an attack of disease or injury.
Seromucous. Composed of mucus and serum.
Serous. Having the nature of serum; watery.
Serum. The clear yellowish fluid separating from the blood after coagulation of the fibrine.
Sialogogue. A medicine increasing the flow of saliva.
Sinapism. A mustard plaster.
Slough. Tissue destroyed by gangrene.
Spleen. An organ of the digestive system.
Squamous. Covered with or consisting of scales.
Sthenic. Active; strong.
Styptic. A medicine that stops bleeding.
Sudorific. A medicine which induces sweating.
Suppurate. To generate pus.
Systole. The contraction of the heart and arteries.

T

Tampon. A plug of lint or cotton.
Tartar. A hard deposit which forms on teeth.
Teichopsia. Temporary dullness of vision, which often accompanies sick-headache.
Tendon. Fiber which holds the muscle to the bone.
Tenesmus. Painful desire to evacuate the bowels or bladder, without result.
Teniafuge. A medicine for expelling tapeworms.
Tetanic. A medicine acting on the nerves, and, through them, on the muscles; pertaining to lockjaw.
Tetanus. A disease characterized by spasmodic and continuous contraction of the muscles.
Therapeutics. The science relating to the discovery and application of medicines.
Thrombus. A clot of blood formed within the heart or blood-vessel caused by some impediment of the circulation.
Tormina. Sharp, griping pains in the bowels.
Torpid. Sluggish.
Torpor. Deficient sensation; abnormal inactivity.
Torticollis. Contraction of cervical muscles, resulting in an abnormal position of the head.
Tourniquet. An instrument to control the circulation by means of compression.
Trachea. The windpipe.
Tracheotomy. Operation for croup.
Trachoma. Granular eyelids.
Transpiration. Exhaling through the skin; perspiration.
Transude. To pass out through the pores.
Traumatic. Pertaining to or caused by a wound or injury.
Triturate. To reduce to a fine powder.
Tubercle. A small swelling or tumor.
Tumefaction. Enlarging or swelling of a part.
Tympanum. The drum of the ear.

U

Ulcer. A pus-discharging sore upon the external or internal surface of the body.
Ulcerate. To produce an ulcer.
Ulnar. Pertaining to the large bone of the forearm.
Umbilicated. Having a depression similar to that of the navel.
Umbilicus. The navel.
Unction. The act of anointing.
Unguentum. An ointment.
Unilateral. Affecting but one side.
Urea. An animal substance in urine.
Uremia. A combination of symptoms due to retention in the blood of substances normally excreted by the kidneys.
Ureter. The canal leading from the kidney to the bladder.
Urethra. The outlet of the bladder.
Urethritis. Inflammation of the urethra.
Urinemia. The existence of urinary constituents in the blood.
Urinometer. An instrument for ascertaining the specific gravity of urine.
Urticaria. Hives; nettle-rash.
Uterus. The womb.
Uvula. The membranous appendix hanging from the free edge of the palate.

V

Varicose. Knotted; swollen.
Varioloid. The slight form of smallpox as modified by vaccination or inoculation.
Vascular. Consisting of or pertaining to vessels.
Venesection. The opening of a vein for the purpose of abstracting blood.
Ventricle. A small, belly-like cavity.
Vermicular. Worm-shaped or with worm-like motion.
Vermiform appendix. A worm-shaped tube opening into the large pouch in which the large intestine begins.
Vermifuge. A medicine or agent which expels intestinal worms.
Vesicant. A blistering agent or application.
Vesication. The formation of a blister.
Vesicle. A small sac containing fluid.
Vicarious. Substituting or taking the place of another, as applied to one organ assuming the functions of another.
Virulence. Malignity.
Virulent. Having the nature of a poison.
Virus. The poison of an infectious disease.
Viscera. Plural of *viscus.*
Viscus. Any organ inclosed within the four great cavities, the cranium, thorax, abdominal cavity, or pelvis.
Vitals. The intestines and organs essential to life.
Vitiate. To contaminate or render impure.
Vitreous. Glassy; transparent.
Void. To evacuate from intestine or bladder.
Volatile. Evaporating.

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